A PROPOSED FRAMEWORK FOR RECREATION PLANNING IN SOUTH AFRICA, WITH PARTICULAR REFERENCE TO THE CEDERBERG

by

BRUCE CHRISTOPHER GLAVOVIC

Submitted to the University of Cape Town
in partial fulfilment of the requirements for
the degree of Master of Science
in Environmental and Geographical Science

APRIL 1988

ABSTRACT

Over the years, recreation opportunities in South Africa have been subject to increasing visitor use and pressure from widespread environmental changes. There has been growing imbalance between recreation opportunities in more and less developed environments. As a result conflicts have arisen between different user groups. The "Cederberg Controversy" demonstrates the need for a redefined, comprehensive recreation planning framework to resolve such conflicts. Traditional recreation planning approaches have not provided a suitable framework. By comparison, the Recreation Opportunity Spectrum concept has considerable potential for aiding recreation planners in South Africa. An application of principles of the Recreation Opportunity Spectrum concept, and closer analysis, reveal that the concept is limited. An extension to the concept is proposed whereby the goal of visitor satisfaction is supplemented by a policy declaration to maintain diverse recreation opportunities. Whenever the consequences of a decision affecting the supply of recreation opportunities are irreversible, the maintenance of diversity should take precedence over visitor demand.

ACKNOWLEDGEMENTS

Many people have made valuable contributions to this report. In particular, I wish to thank:

Roy Stauth for his continued interest, many stimulating discussions and patience in supervising this report.

Nico Geldenhuys and my office colleagues for bearing the brunt of the work-load while I completed "the final draft".

John Raimondo for thought-provoking ideas and advice on the application of the conjoint analysis technique.

Tim Dunne for help with the analysis of the survey results, and for valuable suggestions on a draft of Chapter 6.

Wayne Humphries for designing computer programmes to analyse the survey results.

Officials of the Chief Directorate of Forestry, and the Nieuwoudts, for access to visitor records.

Mrs Andrag and Shirley Butcher for translating questionnaires.

The Human Science Research Council and the South African Breweries for financial support.

My family and friends for their support and encouragement.

My dad for being a ready source of advice and for providing helpful comments on a "rough" draft at short notice.

Finally, I am especially grateful to Janine for typing and illustrating the report. This report would not have been completed without her perseverance and steadfast support.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER ONE: INTRODUCTION

1.1 Nature of the Problem

Over the years there has been a widespread but insidious modification of recreation opportunities in natural areas throughout the world (Jubenville & Becker 1983:304-305; Patmore 1983:199; Singh & Kaur 1986:21). A consequence has been the loss of recreation benefits associated with less developed environments. Such benefits may be irreplaceable and visitors may not be able to find acceptable substitutes in more developed environments. There may therefore be a permanent welfare loss to society.

The modification of recreation opportunities in natural environments is cause for concern, because a fundamental tenet of recreation planning is to cater for the full range of visitor preferences and needs (Wagar 1974:276; Jubenville 1976:20; Driver & Brown 1978:27-29; Clark & Stankey 1979[a]:1-2). Addressing this concern poses a difficult problem to planners, since the conversion of recreation opportunities is partly the indirect result of pervasive environmental transformation. Natural and rural conditions have been increasingly altered by the activities of man and by rapid urbanisation (see e.g. MacKaye 1962; Dasmann 1984). Although largely beyond the influence of recreation planners, environmental transformation has had a significant impact on the balance between recreation opportunities in more and less developed environments.

Management efforts to accommodate increasing visitor use, which has resulted from expanding populations, greater mobility and increased leisure time, have had a direct effect on the growing imbalance between different kinds of recreation opportunities (see e.g. Mercer 1977; Cordell & Hendee 1982; Pigram 1983). Without a comprehensive and

practical framework to assess the most appropriate recreation use of an area, managers have to react on an ad hoc basis. In attempting to meet perceived demand, and to correct or offset impacts that arise, a chain reaction of higher-order impacts may inadvertently be initiated. One consequence may be the loss of non-recreation resource benefits associated with less developed environments, since there is an inherent conflict between certain forms of recreation and certain extensive land-use practices. In addition, these impacts can ultimately change the entire nature of the original set of recreation opportunities. Some visitor groups are likely to find the altered recreation conditions incompatible with their expectations, preferences and needs. The probability of visitor interests coming into conflict therefore also increases (see e.g. Clark, Hendee & Campbell 1971; Jacob & Schreyer 1980; Buchanan & Buchanan 1981). Some visitor groups may be forced to adapt to less fulfilling conditions, or to find substitute recreation opportunities. This process has been described as the sociological equivalent of the ecological concept of "displacement and succession" (see e.g. Hendee & Campbell 1969; Schreyer 1979). In recent years these conflicts have become more apparent in parts of South Africa.

In several countries, researchers and planners have given attention to the development of a recreation planning framework that addresses these conflicts. The Recreation Opportunity Spectrum (ROS) concept has been widely accepted as providing such a framework (see e.g. Wood 1980; United States Department of the Interior, Bureau of Land Management 1981; United States Department of Agriculture, Forest Service [USDA, FS] 1986). In South Africa, however, recreation research is in its infancy and has been conducted largely on an ad hoc basis (Taylor 1984:9-13). Relatively little attention has been given to recreation planning. Some progress has been made with the development of a National Outdoor Recreation Plan (NORP) (Department of Planning and the Environment [DPE] 1978), and a number of isolated

recreation planning studies have been completed (see e.g. A'Bear & Little 1976; Buiten 1976; Lith 1976; Mitchell 1979). Nevertheless a comprehensive yet practical framework to assess appropriate recreation use has not yet been developed in South Africa. To ensure that existing recreation opportunities are maintained and continue to contribute to the whole system of recreation opportunities in South Africa, such a framework is urgently needed.

1.2 Aim and Objectives of the Report

The general aim of this report is to outline a recreation planning framework for South Africa, based on the ROS concept. This framework seeks to ensure that diverse recreation opportunities are maintained, to cater for the full range of visitor preferences and needs in the long term. The specific objectives of this report are to:

(1) Illustrate the need for a recreation planning framework in South Africa, and identify the main issues that such a framework should address.

(2) Develop a rationale for integrating recreation and other land-use practices in a comprehensive land-use planning approach.

(3) Examine whether traditional recreation planning approaches satisfactorily address conflicts between visitors, and between recreation and other land-use practices.

(4) Describe the ROS concept and analyse its advantages and disadvantages for planning recreation.

(5) Investigate visitor attitudes about appropriate future recreation use of the Cederberg, as a first step towards

application of principles of the ROS concept in South Africa.

(6) Formulate an extension of the ROS concept, to reconcile the conflict between meeting visitor demands and maintaining diverse recreation opportunities.

1.3 Study Approach

A controversial proposal for the development of the wilderness area and surrounding land in the Cederberg mountains provided the catalyst for this study (see Figure 1). (Note: According to the Department of Environment Affairs [1986], Cederberg is the official place name for the area.) The "Cederberg Controversy" drew attention to the need for a recreation planning framework in South Africa. By focussing on the Cederberg as a case study, it was possible to highlight the major considerations pertinent to such a framework. Historical patterns of recreation in the Cederberg provided insight into the process of environmental transformation. This process has had a substantial, but indirect impact on the nature of recreation opportunities. It therefore became necessary to develop a rationale for planning recreation in the context of environmental change. This rationale provides planners with a basis for integrating recreation and other land-use practices in a comprehensive manner.

Traditional recreation planning approaches were then examined to establish whether they provide a suitable framework for addressing the conflicts arising from the modification of recreation opportunities. A literature review indicated that the recently developed ROS concept provides a basis for the identification and resolution of such conflicts. The ROS concept appears to have considerable potential for resolving issues such as those arising from the "Cederberg Controversy".

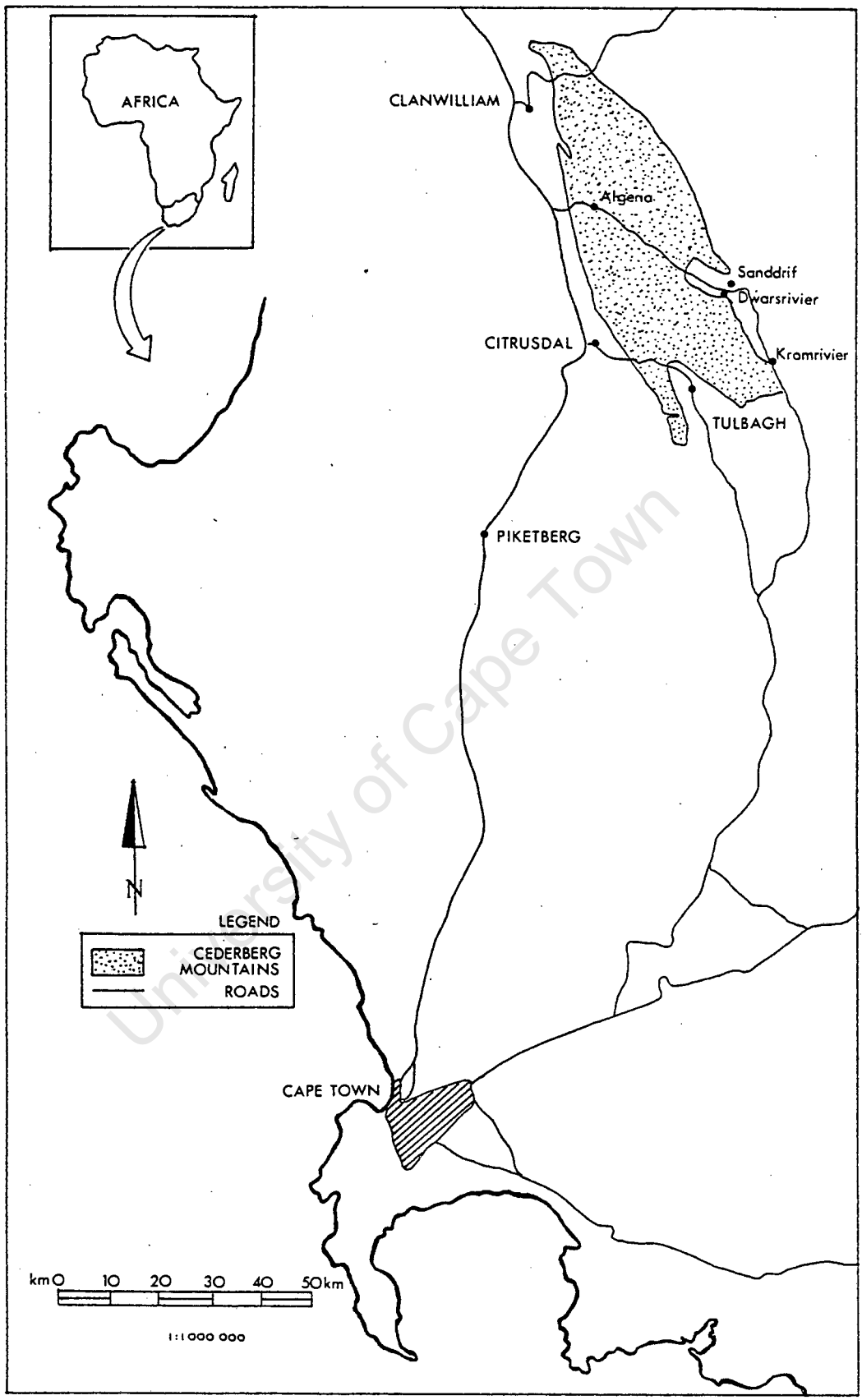


FIGURE 1: LOCATION MAP OF THE CEDERBERG MOUNTAINS

Since no work on the ROS concept has been reported in South Africa, the concept was applied to the Cederberg case study in a survey of visitor attitudes about the appropriate future recreation use of the area. The survey focussed on visitor attitudes about appropriate settings, activities and important experiences. A method for analysing the appropriateness of alternative recreation settings, and the relative importance of attributes that define any particular setting, was needed to more effectively apply the major principles of the ROS concept. An application of the conjoint analysis technique was judged to be particularly well suited to this task. On completion of this survey, the results were analysed to determine the implications for planning the future recreation use of the Cederberg and for establishing a general recreation planning framework for South Africa.

CHAPTER TWO: HISTORICAL RECREATION USE OF THE CEDERBERG

2.1 Introduction

The history of changing recreation use in the Cederberg mountains exemplifies the need for a recreation planning framework in South Africa. A brief presentation of this history highlights principle concerns that should be addressed in such a framework.

2.2 Early History

Bushmen and Hottentot people were early inhabitants of the Cederberg area. The first white people to see the Cederberg were probably members of a Dutch East India Company expedition which reached the Olifants River in 1661 (Bands undated:20-21; Luckhoff 1980:1). To these early explorers the Cederberg and surrounding area was completely wild. Apparently the expedition returned to Cape Town after a lion killed one of the members near Piketburg (Bristow 1985:116). By 1664 a route was pioneered around the mountains. For many years, even with the expansion of the Cape Colony and with Quitrent farmers settling along the Olifants River, only a few explorers ventured into the mountains.

2.2.1 Resource Exploitation and Early Visitor Attitudes

Prior to 1876, resources in the Cederberg could be used by anyone who gained access to them. The practice of burning veld to provide pasture for grazing was adopted by early settlers from Hottentots. For many years, buchu (Agathosma betulina), bush tea (Aspalathus linearis) and tan bark (principally from Heeria argentea) were harvested in the mountains. From the 1700's forests of cedar trees were intensively exploited (Andrag 1977:16-17; Bands undated:21-25). Resources characterised by unrestricted access and

uncontrolled exploitation, are called common property resources. In the absence of effective ownership, such resources are likely to be exploited in excess of their capacity for replenishment (see e.g. Gordon 1954; Hardin 1968). The common property characteristic of resources is a major contributing factor to pervasive environmental degradation (Seneca & Taussig 1984:83) (see Section 3.2.3). By the 1830's the impact of over-exploitation was obvious in the Cederberg. In 1836, the British geographer, Sir James Edward Alexander, visited the area and urged that action be taken to prevent the destruction of the cedar forests (Andrag 1977:18-19; Luckhoff 1980:2). By the time the authorities recognised the seriousness of the problem and introduced controls, the cedar forests had largely been destroyed (Bands undated:23).

People in a commons have an incentive to ignore the social cost of private behaviour. Their behaviour adversely affects social welfare, generating a demand for governmental intervention (Baden 1977[a]:137). Efforts to control resource use in the Cederberg were initiated in 1876 by the appointment of a forest ranger and by the introduction of a permit system. Effective control was however, difficult to implement and over-exploitation continued (Andrag 1977:19; Bands undated:24). In 1897 some 50 000 hectares of the Cederberg were declared a "Demarcated Forest". From this time, increasing management attention was given to controlling resource exploitation (Bands undated:24). In the early 1900's a fire protection scheme was introduced and attempts were made to prohibit grazing in the mountains (Bands undated:27-28). A forest station was established at present day Algeria (see Figure 1) and several huts, tracks and footpaths were constructed in the mountains for management purposes (Andrag 1977:16-17).

Although the Cederberg had been used for many years for non-recreation purposes, it was not until the late 1800's that

its recreation potential was realised (Cameron 1922:84; Bristow 1985:120). In planning one of the earliest expeditions to the Cederberg, Cameron (1922:85) wrote that little was known about the area and that this fact constituted a fascinating allurement. Visitors were able to discover places where no other visitors had been before, an experience Cameron (1924:28) described as being entirely undefinable and seldom forgotten. This view was however, contradicted by his positive attitude regarding the footpaths, tracks and huts constructed by the Department of Forestry. Cameron (1922:89-90) maintained that these modifications enabled the climber to gain the upper levels of mountains with a minimum of effort. Yet such modifications also provided clear evidence of previous use. Cameron thus had ambivalent attitudes towards mutually incompatible experiences. Such ambivalence was also apparent in the attitudes of other visitors (see e.g. Berrisford 1947), and is still evident in general attitudes towards the environment (see Section 3.3.2.1).

By the early 1900's, conditions in the Cederberg had changed from those prevailing at the time of the 1661 expedition. The impact of intensive resource exploitation had become apparent to visitors. Pleas were made for the preservation of the area as a place for "peace and recreation of body and spirit" (Haughton 1927:98). Increased control on non-recreation resource use had been exercised by the Department of Forestry and infrastructure for management activities was being developed. These management activities apparently did not detract from visitor experiences. These activities however, indirectly initiated the modification of recreation opportunities in the Cederberg.

2.2.2 Modification of Recreation Opportunities

From the 1920's, as access improved and knowledge of the Cederberg became more widespread, the area rapidly gained

popularity as a recreation destination. The combination of motor car and mountaineering or "motorneering" (Hallack 1928:98) made shorter expeditions to the Cederberg possible and reduced the amount of planning previously needed (see e.g. Mills 1926; Hallack 1928; Field 1934; Anon 1936). Cameron (1936:26) wrote:

> When we went there in the "old days" it took us just about 24 hours to get to Algeria Forest Station - and that only as a result of elaborate and careful prearrangement. There was the all night journey [from Cape Town] to Graafwater; transport to be found for the 24 miles to Clanwilliam; further transport to Kriedouw; and then a trek with pack donkeys for 10 miles, over a mountain pass 3000 feet high before the base camp could be reached. Now one can breakfast comfortably at home, hop into one's car with almost unlimited food and equipment and arrive at Algeria at lunchtime.

From 1935 the Department of Forestry was aware of the growing use of Algeria as a camp site (Andrag 1977:20). Visitor pressure was also becoming apparent in other areas of the Cederberg. Some popular areas had been "trampled flat" by visitors (Cameron 1936:26). The Department of Forestry apparently did not recognise the consequences of allowing increasing visitor use of the area. Andrag (1977:20-21) cites a report from 1936 concerning the Department's initial policy for outdoor recreation in the area:

> The Cederberg Forest Reserve is one of the finest outdoor recreation resorts in the country, not only its unique scenic features, but also the variety and beauty of its flora and the wealth of its fauna are an asset that will become of even greater value in the future. It is the policy of the Department to increase the provision of facilities for outdoor recreation on the reserve, according to the extent to which the public can make use of them.

In attempting to cater for visitor demands, by providing additional facilities, this policy was to compound the modification already initiated by non-recreation resource

management activities in the area (see Section 4.3). The Department of Forestry failed to recognise that visitor pressures were likely to increase beyond the level at which the benefits originally associated with the area could be sustained.

By 1949 the detrimental effects of increasing numbers of visitors to Algeria had become apparent (Andrag 1977:20). Values associated with the natural character of the area were threatened by excessive visitor use. It had also become more likely to meet other parties on a trip into the mountains. To some visitors, desired levels of privacy were not attained (Berrisford 1947:55-56).

"Feeling crowded" is a subjective evaluation of the number of other visitors seen, rather than the direct consequence of high density situations (see e.g. Altman 1975; Choi, Mirjafari & Weaver 1976; Heberlein, Alfano, Shelby & Vaske 1979). Factors such as the nature of the resource base, the dispersion of visitors, their behaviour, the types of activities, and the times at which encounters take place during activity engagements, are also pertinent (see e.g. Womble & Studebaker 1981; West 1982). Feeling crowded is influenced by expectations, values and attitudes regarding the appropriate number of visitors for an area. Since crowding is a normative concept, the point at which seeing other visitors detracts from one's satisfaction will vary (see e.g. Gramman 1982; Manning 1985[a]). Normative consensus may also be found between some visitor groups (see e.g. Vaske, Graefe, Shelby & Heberlein 1986). Seeing more visitors than one expects can have a marked negative effect on visitor satisfaction (see e.g. Heberlein 1977). As visitor use increases in an area the likelihood of conflicts between visitor groups grows.

From the mid-1960's, there was an upsurge of visitor pressure on areas such as the Cederberg. The rapidly increasing

population, urbanisation and a move towards active multiple-use of State forest lands contributed to this pressure (Andrag 1983:358). In 1967 the de facto campsite at Algeria was officially established. Washing facilities and ablution blocks were provided for visitor convenience. Two old farm houses at Sanddrif (on the farm Dwarsrivier) were made available for hire to the public. A campsite was also established at Sanddrif. Cottages, a campsite, washing facilities, a shop, petrol and a children's play park were provided at Kromrivier (Andrag 1977:2, 21, 77). With improved access and the provision of additional visitor facilities, increasing numbers of people could now enjoy the Cederberg in the relative comfort of a caravan or a cottage.

By the early 1970's, recreation opportunities in parts of the Cederberg had changed substantially from those prevailing in its early history. To those who were originally drawn by the fascination of the unknown country, with its unnamed and possibly unclimbed peaks, such changes were likely to have been greatly disappointing. Conditions were no longer consistent with previous experiences and expectations. The potential for a conflict of visitor interests therefore increased.

Conflicts between visitors may become the major problem facing natural resource managers in the future (Bryan 1979:1). Recreation conflict can be defined as goal interference attributed to another's behaviour (Jacob et al 1980:369). When the behaviour of one visitor group is incompatible with the physical, psychological or social goals of another group, a state of goal interference will result (see e.g. Gramman & Burdge 1981). Conflicts can arise between visitors participating in different activities (see e.g. Noe, Wellman & Buyhoff 1981-1982; Jackson & Wong 1982) and between visitors participating in the same activity in an area (see e.g. Hendee, Gale & Catton 1971; Bryan 1979). Conflicts can also arise between recreation and non-recreation activities

(see e.g. Bonnicksen 1983). Events in the early history of the Cederberg provide evidence of all such conflicts. The underlying reason for such conflicts was the gradual modification of opportunities in the area.

2.3 Recent History

In spite of changes in the Cederberg, substantial parts of the area retained a wilderness atmosphere. As late as 1970, Goy (1970:53-54) described a traverse where he found unnamed peaks and no signs of previous ascents. In the early 1970's, the Department of Forestry gave particular attention to protecting those areas of the Cederberg that retained a wilderness atmosphere.

2.3.1 The Declaration of the Cederberg Wilderness Area

A new era in the history of recreation opportunities in the Cederberg began on 27 July 1973, when about 70 000 hectares (approximately 55%) of the mountains were declared a wilderness area in terms of section 7a of the Forest Amendment Act. According to Ackerman (1972:21), Secretary for the Department of Forestry in the late 1970's:

> (1) A wilderness area must be an undeveloped area, uninhabited by man. It should retain an intrinsically wild appearance and character, or be capable of rehabilitation to such a condition.
>
> (2) It must give the general impression that the particular area has resulted from the combined effects of natural forces.
>
> (3) The area must be large enough, probably at least 1000 hectares, to give visitors a feeling of isolation from the outside world.

By declaring wilderness areas, the Department of Forestry maintained that it protected important scientific and aesthetic values, opportunities for physical and spiritual recreation, and other benefits associated with undeveloped

environments for future generations (Ackerman 1979:3). The declaration of the Cederberg wilderness area might be viewed as the realisation of the 1927 plea for preservation of the area. At the declaration ceremony the then Minister of Forestry pledged:

> to dedicate [the Cederberg] to the people of South Africa as a wilderness area where they can commune with nature as the Creator made it and intended it to be. It is my earnest desire that the Sederberg remains as a wilderness area in perpetuity and I charge my successors in office for all time, to guard and protect this wilderness area against encroachment or alienation to the utmost of their ability (Anon undated:11).

This pledge was indicative of a marked change in the attitude of the authorities regarding the value of the Cederberg. The declaration of the wilderness area brought an end to the exploitation of non-recreation resources and sought to control visitor use. In this way, the benefits associated with a less developed environment could be provided to society in perpetuity.

The satisfaction derived from simply knowing that the Cederberg wilderness has been preserved is an example of a pure public good benefit, i.e. because this knowledge is available to one, it is available to all, and possession of this knowledge by additional people does not detract from the benefits derived by others (see e.g. Samuelson 1955; Baden 1977[a]). In contrast, a pure private good produces benefits that are completely appropriable by the owner. Some goods have a mixture of pure public and pure private good characteristics and produce quasi-public good benefits. The satisfaction derived from participating in wilderness recreation is an example of a quasi-public good benefit. Beyond a point described as the recreation carrying capacity of a wilderness area (see Section 4.4), additional visitors will reduce the satisfaction obtained by other visitors to the area. Provided levels of visitor use are less than the

carrying capacity of the area, no opportunity costs, i.e. foregone benefits, are incurred by additional visitors. In this instance, the quasi-public good benefit (the satisfaction derived from participating in wilderness recreation) is provided by a common property resource (the wilderness area), under conditions of unrestricted access and visitor use below that which generates negative impacts such as congestion (Krutilla & Fisher 1975:25).

In the last two decades, the number of visitors to wilderness areas in South Africa has increased dramatically (see e.g. Pickles 1978; Andrag 1983). Over time, under conditions of no exclusion, visitor use will therefore exceed the capacity of an area to provide sustained wilderness benefits. Additional visitors will generate "spill-over" or external costs, i.e. costs imposed on innocent parties by another's activities. These costs may become so high that values originally associated with the area are destroyed. Patterns of visitor use will then be inconsistent with wilderness management objectives.

2.3.2 Recreation, Visitor Pressure and Non-recreation Land-use Opportunities

Visitor pressure on recreation opportunities in the Cederberg continued to increase in the 1970's. Campsites were normally fully booked during the school holidays and over long weekends. Increasing numbers of visitors were also using the wilderness area. In addition to authorised visitors, many people entered the area without permission. Trampling of vegetation and general denudation, compaction and fouling of the popular overnight sites became more serious problems. Despite notices and requests for visitors to stop littering, regular clean-up work was necessary. But the authorities apparently still felt there was no need to turn people away (Bands undated:36-37). The reluctance to control visitor use is surprising, given the progress made by the Department of

Forestry in stopping the over-exploitation of non-recreation resources.

In 1976 all private land (excluding agricultural land) in the Cederberg was proclaimed part of a Mountain Catchment Area, in terms of the Mountain Catchment Area Act. The prime objective was to ensure optimum flow of unpolluted water from the area. The most effective way of achieving this objective was to maintain the natural vegetation in a healthy and vigorous state. In view of the importance of the Cederberg catchment, other land-use practices in the area had to be made compatible with the objective of water conservation. This requirement affected the nature of recreation opportunities that could be provided on public and private land in the area (Bands undated:38-39, 44). Intensive recreation development that transformed the natural vegetation, for example, would not be compatible with the water conservation objective. A balance therefore had to be found between the various land-use opportunities in the area.

The Directorate of Forestry (formerly the Department of Forestry) made recommendations in this regard in a document stating the policy and management objectives for the Cederberg Mountain Catchment Area for the period 1979/80-1984/85 (Bands undated). According to this policy, nature conservation and the provision of extensive recreation opportunities were to be secondary management objectives for the area (Bands undated:4). The need to introduce stricter control of visitor use in the Cederberg was thus, explicitly recognised by the Directorate of Forestry. In order to ensure that all activities were compatible with the primary objective of water conservation, and to implement controls on visitor use, four zones were distinguished in the Cederberg catchment, namely:

(1) A wilderness zone characterised by low intensity recreation use, with no development and maintained in as

unspoilt a state as possible to maintain the quality of a wilderness experience. Existing huts, footpaths and tracks were to remain only for as long as they were required for management purposes.

(2) A semi-intensive development zone on State Forest land, incorporating the Algeria campsite.

(3) A semi-intensive development zone on private land, (incorporating the privately owned campsites and cottages) next to the wilderness zone.

(4) A zone on private property used for controlled natural resource exploitation, including wild flower production and grazing (Bands undated:56-60).

Particular attention was drawn to the high level of visitor use in the wilderness area. A set of rules, regulations and conditions of access were formulated for the wilderness area by the Directorate of Forestry. Conditions of visitor use included a maximum party size of 10 to reduce the chances of disturbing the experience of solitude; strict instructions about making noise; and complete protection of all things, biotic and abiotic, in the wilderness area (Bands undated:129). It was also decided that the campsite at Algeria should not be enlarged, due to the pressure that would be exerted by campers doing day walks into that portion of the wilderness area close to the campsite. This decision was also held to be pertinent to private campsites and other land adjoining the wilderness area. Careful and co-ordinated planning between the various landowners was considered to be necessary before any such development was embarked upon (Bands undated:37).

2.3.3 Displacement and Succession

Despite the introduction of visitor rules and regulations, some visitors felt conditions had been so transformed over time that a wilderness atmosphere no longer existed in the Cederberg. In a poem entitled, "We'll come no more" McCrea

(1983:65) wrote:

> We turned away from Crystal Pool,
> From waters calm and deep and cool.
> The whispering grass wished us goodbye,
> The only sound the hawk's lone cry.
> Huge grey rocks so starkly bare,
> Undisturbed, and rainwashed air.
> Buttresses massed in solid black -
> They never stirred as we looked back.
> Like sentinels they seemed.
> We trod the path we'd often trod
> To share the land with birds and God.
> Now man had come to this fair place
> Had left his mark for all to see -
> His litter, rubbish and his shame.
> O little man, how small thy name!
> We looked our last on Crystal Pool,
> On waters calm and deep and cool.
> We said goodbye and turned away.
> We'll come no more.

To visitors such as McCrea, recreation opportunities in the Cederberg had been completely altered. Visitor pressures had created unacceptable impacts. The evidence of heavy use was inconsistent with his expectations and previous experiences of the area. Indeed, the external costs incurred by McCrea were now so high that future visits to the area were not considered worthwhile.

The continued high levels of visitor use however, indicate that others were satisfied with the new conditions in the area. Visitors who had become dissatisfied, such as McCrea, had to find alternative opportunities that met their expectations and preferences. Otherwise they had to adapt to the new conditions, and possibly accept less satisfying experiences. At the same time, visitors with no prior expectations of the area, and a preference for improved access, comfortable and convenient facilities and higher levels of visitor use, could move in. This process is described as "displacement and succession" and its negative implications have been known for a long time (see e.g. Hendee & Campbell 1969; Clarke, Hendee & Campbell 1971; Hendee &

Burdge 1974). The phenomenon is insidious and inexorable, because external effects favour recruitment to the externality-imposing use (Stauth 1983:108). The result is therefore a progression of visitor types and activities towards ever increasing levels of use and modification. Aggregate satisfaction in the area remains high, despite the conversion of recreation opportunities (Jubenville et al 1983:310-312). Displaced visitor groups, however, may not be able to find substitute opportunities and therefore incur a permanent loss of benefits (see e.g. Schreyer 1979; Becker 1981; Anderson & Brown 1984). Despite the introduction of management controls, continued visitor pressure on the Cederberg could result in a significant loss of recreation and non-recreation benefits. The development of the "Cederberg Controversy" brought the issue of appropriate future use of the Cederberg into sharp focus.

2.4 The "Cederberg Controversy"

On the 23 March 1984 it was reported in Die Burger that the National Parks Board had applied to the then Minister of Environment Affairs and Fisheries, for control of the Cederberg wilderness area and adjacent state land, with the intention of establishing a national park in the area.

According to newspaper reports (see e.g. The Cape Times 1984:14) the National Parks Board plan included four large base camps on the periphery of the proposed park at Algeria, Citrusdal, Clanwilliam and Tulbagh (see Figure 1). Sixteen smaller "rustic" valley camps were to be established in the mountains. The four base camps would accommodate some 250 people each, while the smaller camps would cater for parties of 10 hikers. A zoning system was outlined which aimed to protect the inherent ecological values of the Cederberg, but at the same time, to develop the outdoor recreation potential of the area.

2.4.1 Public Attitudes

The National Parks Board proposal for the Cederberg caused acrimonious debate. In order to resolve the issue it was referred by the then Minister of Environment Affairs and Tourism (formerly the Department of Environment Affairs and Fisheries), to the Council for the Environment, which had been established to advise the Minister on environmental issues. The Council appointed a committee. Officials of the National Parks Board and the Directorate of Forestry addressed the committee in camera. The committee also invited memoranda from interested parties, conducted interviews, held public hearings and undertook site investigations.

According to the Council for the Environment (1984:2-5) and Snijders (1984:77-81), supporters of the National Parks Board proposal, including representatives of local authorities, commerce and agriculture, had a two-fold argument. Firstly, they suggested that since the demand for outdoor recreation was continually increasing, more opportunities and facilities would have to be provided. The Cederberg provided an appropriate setting of national significance and could accommodate this increasing demand. Secondly, they argued that the development of more intensive recreation facilities would stimulate the economy of the region through an increase in tourism and the creation of employment opportunities. Provided the development was controlled, it was felt that the wilderness atmosphere of the Cederberg would not be adversely affected.

Those opposed to the National Parks Board proposal included members of the public, private landowners in the Cederberg, outdoor clubs, professional environmental scientists and conservation bodies. Their overriding concern was that the wilderness atmosphere of the Cederberg would be destroyed with increased development and additional visitor use. It was argued that the existing undeveloped area should be left in a

natural condition. This area could then continue to provide opportunities to those who were prepared to forego the comforts and conveniences of campsites, bungalow accommodation and related facilities already provided by the Directorate of Forestry and private landowners in other areas of the Cederberg.

Some people advocated a compromise solution. The National Parks Board could provide and manage more intensive facilities outside the designated wilderness area, catering for controlled nature-oriented tourism. The Directorate of Forestry could continue to manage the wilderness and mountain catchment areas, protecting the pristine condition of the environment for nature and water conservation purposes and maintaining the wilderness atmosphere of the area.

Attitudes regarding the appropriate future use of the Cederberg were thus diverse. Each perspective provides an alternative scenario for consideration by planners and decision-makers (see Section 3.5).

2.4.2 Resolving the Controversy

Following the investigation, the Council for the Environment prepared a report for the then Minister of Environment Affairs and Tourism who resolved that:

(1) The Cederberg issue should not be considered in isolation or as an ad hoc problem.
(2) The future of the area regarding its status, management and control can only be considered and resolved in terms of a national policy on nature conservation management and jurisdiction. Since no such policy existed it was recommended that:
    (i) no further action regarding the request by National Parks Board be taken until such time as
        (a) a national conservation policy had been

approved; and

(b) specific recommendations on the future of the Cederberg within the framework of such a policy had been made to the Minister; and that

(ii) the status quo regarding the control and management of the State forests in the Cederberg by the Directorate of Forestry should be maintained in the interim (Wiley 1984:1-2).

The multi-faceted nature of the "Cederberg Controversy" was thus explicitly recognised. In determining the future use of the Cederberg the desired balance between the different, but interrelated, land-use opportunities in the area will have to be established.

The need for a national policy on nature conservation management and jurisdiction is acknowledged. But it is questioned whether such a policy per se, will provide a solution to the "Cederberg Controversy". The central issue, and focus of debate in the controversy, concerned the question of: "What constitutes the most appropriate recreation use or uses of the area?". A conceptually sound recreation planning framework is needed to resolve this question. Neither the Council for the Environment, nor the then Minister of Environment Affairs and Tourism, specifically addressed this need. This shortcoming deserves particular attention because a suitable recreation planning framework has not been developed in South Africa (see Chapter 4).

2.5 Conclusion

Over the years, the Cederberg has gradually been modified. A consequence has been the loss of recreation and non-recreation benefits originally associated with the area. Conflicts between visitors, and between recreation and other land-use practices have also become more apparent. This

pattern of events is part of widespread environmental changes. To effectively plan the future recreation use of the Cederberg, a recreation planning framework is urgently needed that takes into account both direct and indirect pressures on recreation opportunities. Given the interrelated nature of recreation and other land-use practices, attention initially needs to be given to planning recreation in the context of a changing environment.

CHAPTER THREE: DEVELOPING A RATIONALE FOR PLANNING RECREATION IN THE CONTEXT OF ENVIRONMENTAL TRANSFORMATION

3.1 Introduction

The modification of recreation opportunities in the Cederberg is a reflection, and partly the indirect result, of the pervasive process of environmental transformation. This process transcends regional and national boundaries (see e.g. International Union for Conservation of Nature and Natural Resources [IUCN] 1980; World Commission on Environment and Development 1987). Throughout the world, natural and rural conditions have been increasingly influenced and moderated by the activities of man. In particular, the environment has been greatly altered by changing agricultural practices and by rapid urbanisation (see e.g. MacKaye 1962; Dasmann 1984; Goudie 1986). A consequence has been a growing imbalance between recreation opportunities in more and less developed environments. It is therefore necessary to develop a rationale for planning recreation in the context of environmental change. The following discussion provides only a cursory appraisal of an extremely complex subject. Attention is drawn specifically to the great diversity of attitudes towards the environment and the important influence of environmental conditions in satisfying basic human needs.

3.2 The Nature and Scale of Environmental Transformation

3.2.1 The Changing South African Environment

To early settlers, South Africa was a terrae incognitae - a wilderness inhabited by wild animals and savage people (Pickles 1978:115-122). Yet in little over 300 years the South African environment has been dramatically transformed. It now comprises some 58% natural pastures; 25% cities,

towns, roads and railways; 9% cultivated land; 3% nature conservation areas; and 1% forestry areas (Fuggle 1983:25). In the process of this transformation, countless plant communities have been altered, and widespread changes in several biomes have occurred. More than 2370 seed plants and ferns in Southern Africa have become critically rare or are in danger of extinction (Hall 1978 in Jarman 1986:2; Hall & Rabie 1983:166).

Soil erosion, primarily the result of poor farming practices, has destroyed more than 25% of the original soil fertility reserves in South Africa (Rabie & Theron 1983:145). In addition, sprawling low-density suburban development has led to a significant loss of high quality farmland. With the growth of urban and peri-urban areas, the problems of air and water pollution, solid waste, litter, noise pollution, and stress-induced illnesses have also multiplied. These have increased public health hazards, and caused the partial or total collapse of terrestrial and aquatic ecosystems. In addition to the loss of natural amenities, insensitively located infrastructural and urban development have caused serious scenic and aesthetic deterioration (Fuggle 1983:24; Gasson 1987:35).

3.2.2 Global Environmental Change

Parallel changes have occurred on a global scale and have been apparent for over a century. Marsh (1885) was one of the earliest scientists to write about the environmental changes resulting from man's agricultural and industrial activities. He pointed out that the ultimate consequences of these changes were uncertain. He recognised that though there had been much destruction, there had also been considerable benefits to man. But the risk of such widespread changes is growing: in this century, the changes in the natural, rural and built components of the environment have been far greater than ever before. Whereas the upheavals of prehistory took

millions of years to run their course, the current alterations are occurring within decades, within "the twinkling of an evolutionary eye" (Myers 1984:1).

It has been estimated that between 500 000 and two million plant and animal species could become extinct by the year 2000 (United States Council on Environmental Quality [USCEQ] 1980:37). At present rates of clearance, complete deforestation of the Amazon rainforests could occur by 1991 (Lutzenberger 1984:38-46). If current land degradation continues, one third of the world's arable land will be destroyed by the year 2000 (IUCN 1980), and the world's deserts could expand by approximately 20% (USCEQ 1980:33). In addition, at least 3000 square kilometres of prime agricultural land are submerged every year under urban sprawl in developed countries alone. Since the mid-1940's, many city centres have deteriorated with the spread of suburbs and highway or strip-towns. Increasing problems related to traffic congestion and the lack of amenities are being experienced in cities (Dasmann 1984:407-409). In less developed countries, the rapid spread of "uncontrolled settlements" is exerting extreme pressures on sanitation, water supplies, health care, food, shelter, jobs and social stability (Mehmet 1978:72-73; USCEQ 1980:12).

3.2.3 Population Growth and Resource Consumption

There are two fundamental reasons for the rapid and extensive transformation of the environment. Firstly, with the widespread introduction of improved public health measures in the 20th century, the human population has increased rapidly. Between 1800 and 1950 the world population grew from 1000-2500 million. The population is now projected to increase from over 4000 million in 1980 to approximately 6300-6500 million in the year 2000 (Zuvekus 1979:74-77). Population growth rates are particularly high in the third world, with populations doubling every 33 years (Gwatkin & Brandel

1982:34). This population explosion has exerted considerable pressure on available resources and contributed to, among other things, increased malnutrition, crowding, illiteracy and pollution (see e.g. Brown, McGrath & Stokes 1976). In South Africa, the population increased from an estimated five million in 1900 to 28 million in 1980, and is expected to reach 40 million in the year 2000 (Fuggle 1983:24).

Secondly, there is a disproportionately high rate of consumption in developed countries, and in some sectors of several developing countries. The per capita consumption of resources in some developed countries is 40 to 50 times that of certain developing countries (IUCN 1980; Myers 1984:4). In South Africa, the resource consumption potential varies greatly between (and within) population groups, as indicated by a 25:1 ratio in average per capita income (1975) between whites and rural blacks (Nattrass 1981:288).

A simplified representation of the process of environmental transformation is outlined in Figure 2 (page 28). The natural, rural and built environments are represented and symbolised by three distinct settings, namely wilderness, the countryside and the city. Wilderness provides the foundation from which man has created the countryside and built cities. There has been a dramatic shift in the balance between these settings in the last century. Attitudes towards these settings are diverse and ambivalent. In recent decades increasing concern has however, been expressed about the possible negative consequences of an unbridled conversion of the environment. In the past, natural resources and environmental amenities were treated as "free goods", i.e. it was assumed that their supply would exceed demand at zero cost. Because many such resources exhibit common property resource characteristics, degradation and depletion may result from overuse. Patterns of resource use in the early history of the Cederberg demonstrate this point clearly (see Section 2.2.1). Formerly "free goods" have thus more recently

become scarce goods (Seneca & Taussig 1984:5).

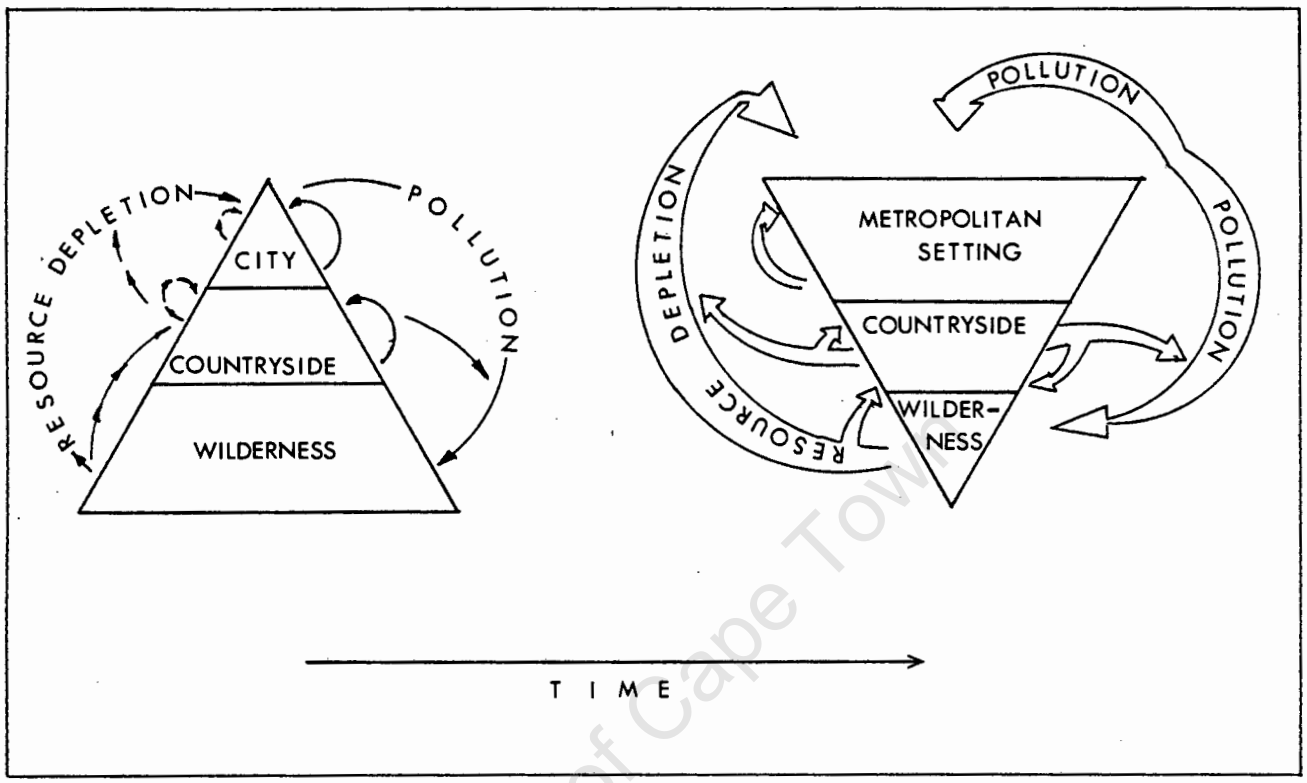


FIGURE 2: THE PROCESS OF ENVIRONMENTAL TRANSFORMATION

3.2.4 The Complexity of Environmental Change

Efforts to resolve problems associated with the transformation of the environment have become very complicated, involving technological, economic, ecological, social, institutional and political considerations (O'Riordan 1971:1-3; McInerny 1981:33). An underlying reason for this complexity relates to the uncertainty of the effects of environmental change. For example, it is not even possible to predict the consequences of destroying particular plant and animal species that are currently used in the development of natural products. This would require, among other things, knowledge of the probabilities of discovering improved products and how these probabilities would be affected by the

extinction of a particular species containing part of the required genetic mosaic. In addition, species are not independent, so there are also opportunity costs created by the ecological dependence associated with the extinction of a species. These values are exceptionally difficult to estimate (Brown & Goldstein 1984:309).

Moreover, because of the complexity of interrelationships between biotic and abiotic components of the environment, it is not possible to clearly identify those species that can make a positive contribution to human welfare (Leopold 1953:161). Even when information does exist, it is not always available to users or managers, nor is it understood by all people (Cooper 1981:85). As new products and technologies are introduced, uncertainty about the effects of resource use and environmental change increases (Dasgupta 1982[a]:109-110). Mishan (1977:84) points out that our knowledge is much greater than it was in the past, but in relation to the scale and range of our intervention, it is much smaller. The full range of ecological and genetic consequences of our current intervention in the biosphere cannot be known for decades, and they could turn out to be disastrous and irrevocable.

The continued transformation of the environment is thus likely to have profound, yet uncertain impacts on individuals, communities and society as a whole. Although many of the impacts could be deleterious to man, modern technological advances could continue to provide many people with high standards of living (and raise the aspirations of others), increase opportunities for choice, facilitate more leisure time and improve methods of communication (Barbour 1980:36-37). The uncertainty of the effects of environmental change has fostered a diversity of attitudes towards the environment and given rise to conflicting views of appropriate resource use. Uncertainty is thus an underlying cause of the acrimonious debate on environmental issues (Dasgupta 1982[a]:109).

Intense debate occurs because perceptions of appropriate resource use reflect widely divergent attitudes, based on different interpretations of available information. In addition, because there is a diversity of human values and preferences, what satisfies one group may be abhorrent to another, and what constitutes a solution to a problem for one group may generate problems for another. Such a conflict of interests is clearly reflected in the "Cederberg Controversy" (see Section 2.4.1). Planning should therefore illuminate the range of choice in terms of specific objectives, alternative courses of action and their possible consequences. The public, or its representatives should then select from among the alternatives (Fox 1970:217). In order to define the range of choice, a clear understanding is needed of the nature of human values and the diversity of attitudes towards the environment.

3.3 Human Values and Attitudes Towards the Environment

Attitudes towards the environment vary considerably and this is due partly to divergent human values. Clarity on the distinction between attitudes and values is therefore needed.

3.3.1 Human Values

Human values are ideal units of meaning (Kraft 1981:6-7). They influence behaviour and therefore can be studied by observation. Values are end-states, or qualities which are perceived to be desirable and they direct thought processes and actions (Brown 1984:232). They are tendencies of people to devote their time, energy and money to attain certain ends. (Baier 1969:40). Human values are thus prescriptive or proscriptive beliefs, wherein some means or end of action is judged to be desirable or undesirable (Rokeach 1973:6-7).

An individual will have a number of values which describe his value system (Rokeach 1973:5, 11-17; Brown 1984:232). A value

system is a learned organisation of principles and rules to help one choose between alternatives, resolve conflicts and make decisions (Rokeach 1973:14). A value system is stable enough to reflect sameness and continuity of a personality, socialised within a given culture and society. A value system however, permits rearrangement of value priorities as a result of changes in culture, society and personal experience (Rokeach 1973:11). Human values differ from attitudes:

(1) A value is a single belief which transcends objects and situations, whereas an attitude refers to an organisation of several beliefs focussed on a given object or situation.
(2) In contrast to an attitude, a value is a standard.
(3) The number of values held by a person is limited by the number of beliefs he has, whereas the number of attitudes a person has reflects the encounters he has had with specific objects or situations.
(4) Values are central to one's personality, and cognitive system. They have a more immediate link to motivation (see Section 3.4) and are therefore determinants of attitudes as well as of behaviour (Rokeach 1973:18-19).

3.3.2 Attitudes Towards the Environment

As the environment has been transformed, attitudes towards the wilderness, countryside and city settings have changed.

3.3.2.1 Historical Attitudes

The Wilderness - Countryside - City Continuum:

The word wilderness probably originates from the Old English "wild-deor-ness", meaning the place of wild beasts (Nash 1982:2). In the Bible, wilderness conveys the impression of an uninhabited, desolate, arid and vast wasteland. It is seen as a God-forsaken and even cursed place. But wilderness is

also seen as a place where one can spiritually cleanse and prove oneself worthy of God (Nash 1982:13-17; Bratton 1986:409-411). More recently wilderness has come to symbolise man's stewardship responsibility on earth. It is viewed by some as a contemporary form of sacred space, and is valued as a focus for religious feeling (Graber 1976:ix). Nonetheless ambivalence, a blend of attraction and repulsion, is still the most accurate way of characterising recent attitudes towards wilderness (Nash 1973:xii).

The countryside has also conveyed varied and ambiguous meanings. Despite the attractiveness of the countryside, and the appeal of the life-style of rich country squires, it has been an exacting and even miserable environment for many, including slaves, serfs, sharecroppers, subsistence farmers and others from various cultures both past and present (Tuan 1978:29-30, 248). The adversity of labour is however, usually ignored in descriptions of the pastoral idyll (see e.g. Williams 1985). These themes give rise to divergent attitudes towards the countryside.

Studies of attitudes towards cities reveal many different themes. The city has excited love and hate since its foundation in Mesopotamia. It has symbolised order, freedom and glory, but also worldliness, the corruption of virtues, and oppression (Tuan 1978:31). Until the middle of this century, cities grew by concentrating more people and buildings around important regional nodes. As the use of private motor cars increased, development spread to the countryside and city-dwellers became suburban dwellers. Decentralisation then became the model of urban growth for the first time in history (Fabos 1979:1). With decentralisation, and the expansion of cities into the countryside, increasingly negative characteristics have been associated with cities (Friedmann 1964:346-347; McHarg 1973:173-174; Dasmann 1984:407-409) (see Section 3.4.3). In the writings of most western intellectuals at least, hate has

thus tended to overshadow love of cities in the modern period (Tuan 1978:31).

Although there has always been a diversity of attitudes towards these three settings, over time there has been a general volte-face in attitudes towards them. The growth of Romanticism in the 18th century, coupled with the real and imagined failings of the Industrial Revolution, led public opinion to emphasise the merits of wilderness and the countryside, as opposed to those of the city (see e.g. Marx 1973; Tuan 1974; Williams 1985; Thomas 1983). This trend has been strengthened in more recent years with the growth of "ecological consciousness" (Barbour 1980:22-24). These changing attitudes are illustrated in Figure 3 (see page 34). Although the wilderness and countryside settings have had more positive associations than the city setting in recent decades, there is still a marked degree of ambivalence in environmental attitudes. On the one hand, we extol the virtues of the natural environment and want to preserve it intact for its own sake. On the other hand, we resent any restrictions on the expansion of the built environment (Dubos 1980:128-129).

In South Africa, the development of a colonial-romantic attitude towards man and the natural environment became prominent among whites in the 18th century, and has been reinforced in recent times (see e.g. Pickles 1978). The "Cederberg Controversy" however, reflects that there are still divergent attitudes regarding the value of different environmental conditions.

The Anthropocentric - Biohumanist - Ecocentric Continuum:

Prevailing attitudes towards the environment describe a continuum ranging from extreme anthropocentrism (human-centred), to biohumanism (centred on human relationships with other life), to ecocentrism (centred on the global ecosystem

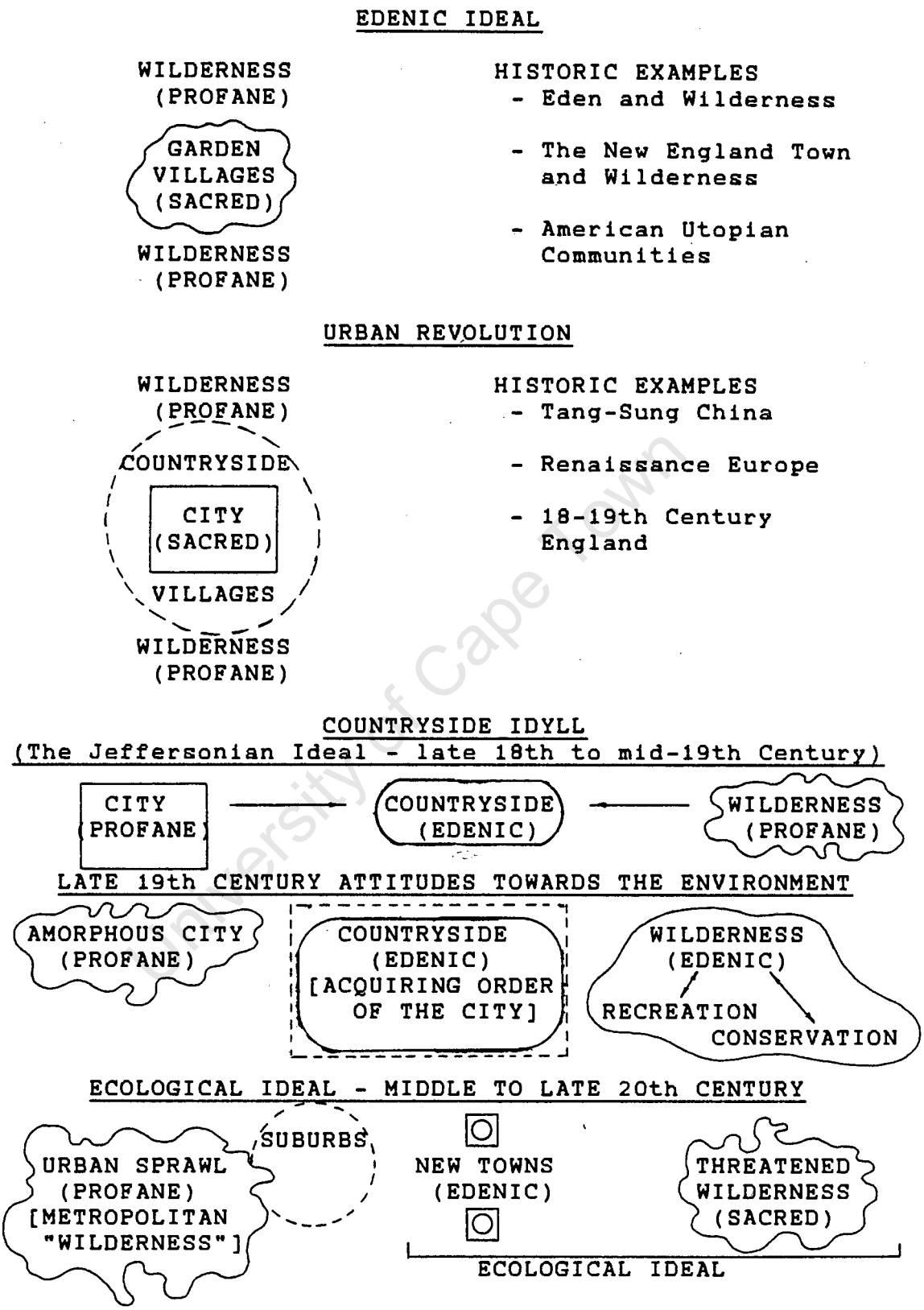


FIGURE 3: ENVIRONMENTAL CONDITIONS AND CHANGING ATTITUDES
(After: Tuan 1974:104-105)

and views man as part thereof) (see e.g. Barbour 1980; O'Riordan 1976; O'Riordan & Turner 1983; Pepper 1984). The distinction between these attitudes is blurred and people exhibit different attitudes depending on the institutional setting, issue at hand and their changing socio-economic status (O'Riordan 1976:2).

Extreme Anthropocentric Attitudes:

Anthropocentrism is the view that human needs and wants are of supreme, even exclusive value and importance (Partridge 1984:103). The "extreme anthropocentric" attitude envisages a future in which man's ingenuity and technological capabilities will enable him to solve the problems associated with environmental transformation and eventually to become independent of the natural environment (see e.g. Fuller 1970; Susskind 1973). Some scientists and economists now envision a future in which the only essential raw materials will be energy and the most basic chemical molecules (Seneca et al 1984:8).

> [S]cientific research and the promise which it holds for the years ahead has made the threat of famine go away ... nations no longer need to fear that their survival will be threatened by a lack of essential raw materials ... scientific research and development have provided the human race with more freedom and flexibility than in the past (Maddox 1972:232-233).

Biohumanist Attitudes:

Biohumanism draws elements from both anthropocentric and ecocentric attitudes (O'Riordan et al 1983:6). Biohumanists would argue against the continued transformation of the environment for biological, economic, aesthetic and moral reasons.

According to biohumanists, the natural environment has a

finite capacity to supply resources, which if exceeded will result in potentially irreparable damage to ecological processes and life support systems. It is held that man has an evolutionary and genetically based need for nature. The destruction of the natural environment would therefore threaten man's survival. Moreover, because of the complex and interrelated character of ecological systems, it is held that man has a limited ability to substitute technology for the resources of nature. Biohumanists therefore recommend protection of the natural environment as a form of enlightened self-interest (see e.g. Meadows, Meadows, Randers & Behrens 1972; The Ecologist 1972; IUCN 1980).

Biohumanism recognises material and spiritual benefits of nature. Miller (1982:113) claims that the quality of life would be diminished by the loss of values associated with the natural environment. In addition, it is held that the quality of moral life is enriched by a self-transcending concern for the welfare of wild species and their habitats (see e.g. Shields 1973; Partridge 1984).

Ecocentric Attitudes:

Ecocentricism views man as part of the global ecosystem. Even if man were to become extinct, it is said that there would still be a purpose and meaning in the continuance of life on earth (Pepper 1984:27-28). In practice, ecocentric proponents seek harmonious integration of human life with nature (Barbour 1980:18-24).

An ecocentric perspective that is becoming popular in modern westernised countries is expressed by proponents of "deep ecology". The term deep ecology was coined by Naess (1973). Deep ecology is premised on the notion that there is no dichotomy between the human and non-human realms of existence. The fundamental objective of the deep ecology movement is to develop ecological consciousness - for man to

rediscover his place in nature.

> If we harm the rest of Nature then we are harming ourselves. There are no boundaries and everything is interrelated. But insofar as we perceive things as individual organisms or entities, the insight draws us to respect all human and non-human individuals in their own right as parts of the whole without feeling the need to set up hierarchies of species with humans at the top (Devall & Sessions 1985:68).

Deep ecologists urge man to radically change his ways and to strive towards minimum impact on other species and the earth. They are totally opposed to current patterns of resource allocation and use which promote continued transformation of the environment (Naess 1984:265-270).

3.3.2.2 The Value of Maintaining a Diversity of Attitudes

Santmire (1973:66) claims that society shows signs of an "ecological schizophrenia". On the one hand, an extreme anthropocentric attitude seeks to dominate nature. On the other hand, an ecocentric attitude reveres unity with nature. These conflicting "civilisation versus nature" and "nature versus civilisation" perspectives have divergent implications for social well-being. Dewey (cited in McAllister 1980:280-281) warned against dogmatism that can follow from tightly defined conceptions of social well-being. Given the rapid and widespread transformation of the environment, and the uncertainty of long term effects of this process, there is a need to maintain a diversity of values and attitudes.

> A viable society encompasses a great deal of diversity in abilities, ideas and concepts, which allow it to meet the challenges of a changing world ... Where there is little diversity in viewpoint, where there is great uniformity of knowledge, ideas and beliefs, the danger exists of a society which will be unable to meet the challenges of change, merely because it lacks the flexibility which would allow it to find answers to the new problems posed (Meester 1982:12).

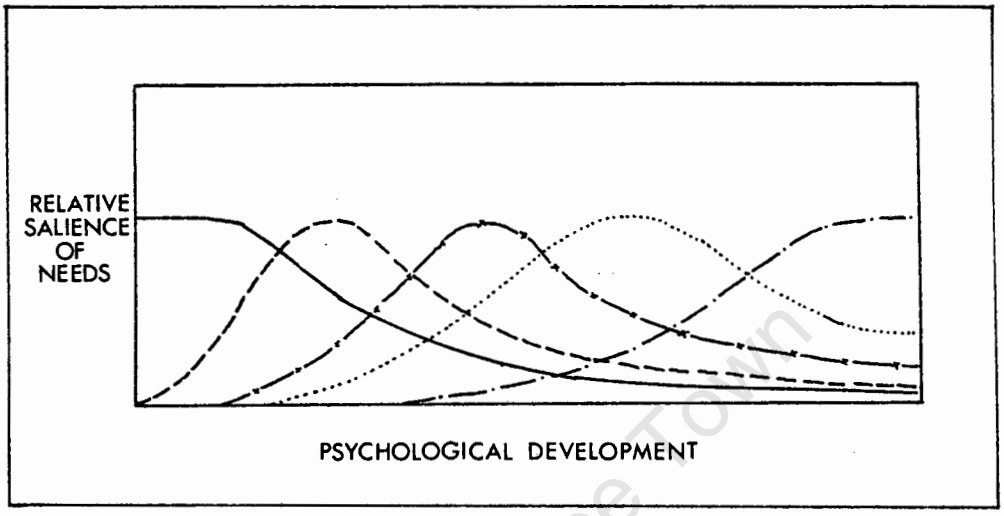
In developing a rationale for planning recreation, one should therefore avoid the tendency to impose uniform standards upon all individuals. There is however, a need to regulate and direct human activity. Although an individual's impact on the environment may be negligible, when summed over all individuals substantial adverse impacts may be imposed on society as a whole. Individuals should therefore be compelled to make decisions collectively in the proper institutional context (Barnett & Morse 1965:586; Dohan 1977:138; Brown 1984:240-241). Decisions based on rules that favour the community are more likely to promote general welfare than those favouring the individual (Hooker 1976:182). There is a need for social decision-making which has as its reference point that which is good for mankind in general. Decisions should therefore be based on consequences for ends, not means disconnected to ends (McAllister 1980:23-24). The question arises: "What promotes the biological, psychological and social health of man?"

3.4 Human Needs and the Environment

According to Maslow (1970:36-46), man has a hierarchy of basic needs which are necessary for his physiological and psychological well-being. These needs are outlined in Figure 4 (page 39).

Maslow stressed the non-substitutability of basic needs and the developmental nature of motivation. As a lower-order need is satisfied, a higher need emerges. These are not sharp discontinuous steps, but rather like a succession of waves in which predominance among different needs gradually shifts from lower to higher needs. Only when one is released from the domination of lower-order needs can one become motivated by other drives. If an individual is not cognitively aware of certain basic needs, these cannot be transformed into values. Human values are cognitive representations and transformations of individual needs, and social and

institutional demands. Needs therefore have to be transformed into values before they can be defended, justified, advocated and exhorted as personally and socially desirable (Rokeach 1973:19-20).



KEY: PHYSIOLOGICAL: ———— SAFETY: - - - - -
LOVE: —×—×— ESTEEM: .....
SELF-ACTUALISATION: —·—·—

FIGURE 4: PROGRESSIVE CHANGES IN THE RELATIVE SALIENCE OF MAN'S BASIC NEEDS, ACCORDING TO MASLOW
(Source: Krech, Crutchfield & Livson 1974:462).

Ideal environmental conditions will facilitate the gratification of each level of need as it reaches its crest in the individual. One will therefore be able to achieve self-actualisation, or fulfillment of one's inherent potential. An environment that inhibits the realisation of basic needs may give rise to various dimensions of poverty (Ellis 1984:9-18). A person deprived of basic needs may thus be subject to physical and mental ill-health (Maslow 1970:92). Given the nature and scale of environmental change and the association between human needs and environmental conditions, the question arises of: "What kind of environment best caters for human needs?"

Focussing on the relationship between human needs and environmental conditions is particularly appropriate for developing a rationale to plan recreation in the context of environmental change. Maslow's needs levels are as apparent in recreation as in other aspects of our work and community life (Jubenville 1976:62). Recreation planning should thus be undertaken in the context of the totality of human needs (Murphy & Howard 1977:11-12). Driver & Tocher (1970:29) advocate that the ultimate objective of recreation planning is to promote self-actualisation. The recreation planner's task should be to aid people in actualising potentials and create an environment that promotes self-satisfaction and happiness. Careful attention should therefore be given to finding ways to enhance environmental conditions which contribute to the satisfaction of human needs, while containing those which detract.

3.4.1 Human Needs and the Natural Environment (Symbolised by the Wilderness Setting)

Many processes essential for human survival and quality of life are dependent upon ecological processes of the wilderness setting (Odum 1971:408-431; Westman 1977:960-965; Botkin 1984:66). In the foreseeable future technological replacement of such processes is not likely to be feasible, or else may be prohibitively costly (Krutilla et al 1975:40-45; Farnworth, Tidrick, Smathers & Jordan 1983:23-26). Although there is no fixed, universal relationship between diversity and stability (Odum 1971:256; Pimm 1984:321-326) there tends to be ecological security in complex trophic structures (Southwick 1976:14; Dasmann 1984:105). Maintaining a diversity of genetic resources, through the protection of wilderness, provides a form of safety assurance against the potential collapse of disrupted ecosystems, and could provide a basis for recovery from an ecological disaster (see e.g. Soule & Wilcox 1980; Jain & Sastry 1984; Wilson 1984). Therefore the maintenance of ecological processes and systems

is considered to be vital to meet the needs of all societies, regardless of their stage of development (IUCN 1980).

Some people maintain that wilderness has important historical and cultural value, contributing to a sense of belongingness and identity. Wilderness is also said to provide opportunities for people to experience challenges, develop a sense of competence and self-reliance, and fulfill aesthetic and cognitive needs (Nash 1976:29-36; Rolston 1981:119, 127-228; Carlson 1984:31-34; Meier 1984:156-161; Rolston 1985:29). Wilderness may thus be an important setting for achieving self-actualisation (see e.g. Scott 1974; Young & Crandall 1984).

Although wilderness can be an important setting for the gratification of each level of basic needs, for many countries which lack both space and affluence, the protection of wilderness is no longer considered to be an option (Prescott-Allen 1984:40). In many third world countries, wilderness resources are held to be necessary for meeting the immediate needs of increasing populations faced with abject poverty (Hanks 1976:13). It is argued that technological advances will facilitate the eradication of pests and debilitating diseases, and make the wilderness setting hospitable for human settlement and cultivation (Zuvekus 1979:30-33).

3.4.2 Human Needs and the Rural Environment (Symbolised by the Countryside Setting)

The countryside is the centre of agricultural production, providing products essential for sustaining rural communities, and growing urban populations. In some countries, agricultural surpluses provide foreign exchange that can be used to enhance the welfare of its population. Food production also contributes to the formation of human capital as good nutrition improves the quality of the labour

force (Zuvekus 1979:205). A countryside characterised by agricultural systems with a high diversity of species and active interaction with natural habitats increases the range of choice and may provide more assurance against ecological disturbance than monoculture systems (Tinley 1979:34-35). Maintaining such conditions is however, at the cost of reduced production efficiency.

The countryside can also provide the setting for small town living. Small towns are associated with warmth, spontaneity and security, and many exhibit stable and neighbourly community relationships (Saarinen 1976:76-80). Community living caters for man's need for co-operation (Friedmann 1964:343). The countryside can also offer a setting for healthy outdoor living. It may also provide an important indication of old and stable land-use patterns that should be protected to maintain a traditional way of life that has scientific, aesthetic and interest value (United Nations Educational, Scientific and Cultural Organisation [UNESCO] 1974:22; Melnick 1983:85-86).

Although the countryside can provide an important setting for meeting basic needs, in many less developed countries rural populations lack adequate food, medical care, housing and social services. Despite rapid migration to urban centres in recent decades, the bulk of the population of these countries live in the countryside in conditions of absolute poverty (Mehmet 1978:60-63).

3.4.3 Human Needs and the Built Environment (Symbolised by the City Setting)

The city is said to be the only setting designed exclusively for man. Its only reason for existence is to provide for human convenience, security, comfort, pleasure, and even exaltation (Downey 1974 in Tuan 1978:31). The culture of cities is ultimately the culture of life in its higher social

manifestations (Mumford 1946:492). Cities can however, be of two types: the truly urban or ideal city, and the metropolitan setting. The former is characterised by the tendency to grow and develop, where "culture evolves the ends of life". The latter is characterised by the tendency to become mechanised and merely expand, where "civilisation produces the means of life". The distinction is between "infinite variety and restless change" and "monotonous uniformity" (MacKaye 1962:215-216, 220).

It has long been recognised that cities, in the truly urban sense, serve a variety of social purposes and meet an array of human needs (Lampard 1964:324). Aristotle said men come together in cities in order to live, and they remain together in order to live the good life (Mumford 1946:492). The ideal city is seen to be more than a centre for manufacture and trade. There is social heterogeneity and cultural vitality, inventiveness, creativity, rationality and civic consciousness in an ideal city (Friedmann 1964:345, 359). According to Mumford (1946:480):

> The city fosters art and is art; the city creates theater and is the theater. It is in the city, the city as theater, that man's more purposive activities are formulated and worked out, through conflict and cooperating personalities, events, groups, into more significant culminations.

When the city ceases to be a symbol of art and order, it affects people in a negative fashion. It expresses and helps to make more universal the fact of disintegration (Mumford 1946:6). The "monotonous uniformity" of the metropolitan setting then becomes the predominant characteristic of the built environment. Despite efforts to stem the spread of the metropolitan setting in several countries, population densities have in general continued to decrease in central cities and to increase on city outskirts (Fabos 1979:16-22). Inner cities have also been associated with increasing crime and juvenile delinquency. They also tend to accommodate the

old-aged and under-privileged. Contacts in a city of this nature become impersonal, superficial, transitory and segmental. Despite close physical contact, there is great social distance causing loneliness and mental strain. On the periphery of these cities, suburbia spreads out in a uniform fashion providing few amenities. It has been described as neither farm-land nor city, but neglected land in transition (Dasmann 1984:407-409).

In less developed countries, high density "shanty towns" may develop in and around cities, lacking even the most basic amenities (USCEQ 1980:12). Although there may be a well-developed community spirit in some third world cities, the dramatic population drift from the countryside has generated unmanageable pressures on basic social services (Mehmet 1978:72).

3.5 The Planner's Dilemma

The planner faces an extremely complex task in seeking to enhance environmental conditions which promote man's health, and to contain those which have adverse effects. Although each setting contributes to meeting basic human needs, each may also detract from individual, community or social well-being.

The full consequences of the relentless process of environmental transformation are unknown (see Section 3.2.4). Attitudes towards the environment, and the issue of appropriate resource use, thus vary greatly. In addition, because of the highly interdependent nature of modern society, the pattern of resource use of one group, seeking to maximise its own welfare, frequently generates negative impacts that "spill-over" onto others. These people may have different values and attitudes about what constitutes "the good life and who deserves its fruits" (Gilbert & Specht 1977:1). Values reflect fundamental principles on which

people are generally not willing to compromise (Skolimowski 1975:8). The question of what constitutes appropriate resource use, whether at the local scale as in the "Cederberg Controversy" or the global scale, is therefore the subject of intense debate. The dilemma is how to chart a course of action that will address the immediate needs of increasing numbers of people with growing aspirations, but limited opportunities, without destroying the environmental conditions that facilitate the gratification of higher-order needs and cater for the future needs of society.

There is no objective solution to this dilemma. The function of theory is not to furnish a substitute for personal reflective choice, but to be an instrument for rendering deliberation more effective and hence choice more intelligent (McAllister 1980:280). Regardless of the institutional context, planning is based on subjective perceptions of the relative importance of issues. Planning is therefore not value-free (Rittel & Webber 1977:144-145; McAllister 1980:261-262). The choice of planning approach depends on the perceived nature and definition of the problem, and the use of any particular approach necessarily makes certain assumptions about the nature of the problem to which it is applied (Cartwright 1977:119-127). Planning is unavoidably based on values, attitudes and prejudices. Therefore it is vitally important that value judgments and their implications be made explicit (Matthews 1975:128).

3.6 The Need to View Recreation as Part of a Comprehensive Land-use Planning Approach

To plan recreation in the context of the totality of human needs, and to aid in resolving the "planner's dilemma", the issue of appropriate recreation use should be seen in the context of other potential land-use opportunities. A major difficulty facing planners is to reconcile valued, but mutually incompatible land-use practices. Developed

recreation opportunities, such as urban parks, can often be well integrated into the surrounding city and may be compatible with a variety of non-recreation uses (Foin 1976:411-414). The task of reconciling incompatible activities has however, been particularly onerous in the context of less developed recreation opportunities, such as wilderness (see e.g. Hammond 1970; Haight 1974; McCabe 1972). The preservation of wilderness areas would seem to exclude any other use, except only the most temporary and transient of recreation use. Multiple-use of such areas has therefore been highly contentious (see e.g. Lucas 1964; Foote 1973; Anon 1975; Rickart 1979-80). McHarg (1971:104) wrote that:

> any place is the sum of historical, physical and biological processes, that these are dynamic, that they constitute social values, that each area has an intrinsic suitability for certain land uses and finally, that certain areas lend themselves to multiple coexisting land-uses... A recognition of these social values, inherent in natural processes must precede prescription for the utilization of natural resources... The social values represented by the natural processes more often than not are inherently suitable for a multiplicity of human uses... Multiple use of some areas may be permitted if it is assured that intrinsic values are not compromised. Yet in other cases where two uses are coequally suitable, it remains with society to make the choice.

Recreation planning should therefore be part of a comprehensive land-use planning approach, based on goals that maximise social well-being.

It is generally accepted that any system of development should be based on the rights of people to acceptable standards of health, nutrition, education, livelihood and social well-being consistent with human dignity (United Nations 1977:44). Stauth (1980:83) proposed five goals for the well-being of society, based on Maslow's needs:

(1) Health and physical well-being (physiological needs)

(2) Protection from violence and insecurity (safety needs)
(3) Social stability and economic justice (belonging, love and esteem needs)
(4) Aesthetic, cognitive and spiritual satisfaction (self-actualisation)
(5) Needs and aspirations of future generations (to sustain social progress)

As with Maslow's needs these goals are hierarchical but inseparable. Relative prepotency holds but over-gratification of a goal does not contribute to the satisfaction of the next highest goal (Stauth 1980:85).

3.7 The Value of Maintaining Diverse Environmental Conditions

Rapid population growth and high levels of consumption have altered the environment and precluded many people from attaining even the lower-order goals for social well-being (see Section 3.2.3). The continued transformation of natural and rural conditions, coupled with the spread of the metropolitan setting, may therefore be inimical to the satisfaction of individual needs and for sustained social progress.

> One of the greatest obstacles to conservation, wise use and sound management, of natural ecosystems, is that Man does not recognize, or else grossly under values, the functions and services of these systems... Because these services which are rendered by natural systems at the local, regional, and global, levels remain widely unrecognized, the values of natural systems (beyond their market value of extractable goods) seldom influence land-use decisions. Moreover, mechanisms to reflect such values and to influence management decisions accordingly, are widely absent (Farnworth, Tidrick, Jordan & Smathers 1981:275).

3.7.1 The Paradox of Man's Adaptability

To urban dwellers, natural and rural conditions may appear to

be irrelevant concepts that have little to do with all that is necessary for human life. The actual sources of food and water, for example, may only seem remotely connected to the life and work of an urban dweller. In addition, the urban setting *per se* may not adequately cater for the moral and religious sentiments of people (Tuan 1978:25). With the continued transformation of the environment, people may accept less and less fulfilling conditions. It has been suggested that people could be manipulated to use and want environmental conditions that can be manufactured at low cost. Plastic trees, for example, could give people the feeling that they are experiencing nature (Krieger 1973:451-453). Although man's ability to adapt to changing conditions has been a key to his success, man's ability to adapt to adverse conditions and habits could, paradoxically, prevent the attainment of full physical and mental potential. A lowest common denominator of existence may then become the accepted standard of life (Dubos 1965:278).

If new environmental conditions are resulting in reduced biological, psychological and social well-being, it is because society's values are aberrant (Skolimowski 1975:8). A change in values and attitudes is therefore required to bring about real change in patterns of resource use (Pepper 1984:1-3). But if people are not even aware of the way in which their needs can be met by the environment, they will not be able to recognise or develop values which can then be considered desirable and be defended (see Section 3.3.1).

3.7.2 The Cost of Irreversible Changes

Man's capacity to alter the environment exceeds his understanding of its functioning, and man's ability to control his impacts is limited (Dorfman & Dorfman 1972:xiv). There may be thresholds beyond which the continued transformation of the environment will cause *irreversible changes* that are detrimental to human welfare. Krutilla *et al*

(1975:43-47) argue that man-made substitutes may not be technologically feasible, nor affordable, for the particular function or need the natural environment serves, and that restoration may require geological rather than economic time scales. Even where possible, artificial restoration may not be valued as highly as the original condition because of the significance of authenticity to some people. In addition, the satisfactions obtainable from particular natural resources may have no substitutes. Therefore no amount of satisfaction of other desires will compensate for the lost resource. Krutilla (1967:783) pointed out that over time, the natural environment will represent an irreplaceable asset of appreciating value because of the asymmetric implications of technology i.e. the marginal trade-off between manufactured and natural amenities will progressively favour the latter.

> At any point in time characterized by a level of technology which is less advanced than at some future date, the conversion of the natural environment into industrially produced private goods has proceeded further than it would have with the more advanced future technology. Moreover, with the apparent increasing appreciation of direct contact with natural environments, the conversion will have proceeded further, for this reason as well, than it would have were the future composition of tastes to have prevailed. Given the irreversibility of converted natural environments, however, it will not be possible to achieve a level of well-being in the future that would have been possible had the conversion of natural environments been retarded. That this should be of concern to members of the present generation may be attributed to the bequest motivation in private economic behaviour as much to a sense of public responsibility (Krutilla 1967:784-785).

Future generations, who might be adversely affected by current decisions concerning the natural environment, have no way of negotiating with present generations, despite the fact that they may be willing to pay current generations to prevent change (Fisher & Krutilla 1974:106). Irreversible changes may therefore be very costly because demand for a

resource of fixed or declining supply, and with no close substitutes, may tend towards infinity. Society may have to trade-off one irreplaceable asset to secure another, but such a "tragic choice" does not obscure the overwhelming desire not to do so at all (Goodin 1983:61-62). To choose extinction however, creates the possibility of large future losses (Bishop 1978:12). The overriding concern about irreversible changes or extinction, be it ecological or cultural, is that it reduces choice. According to a central postulate of welfare economics, a reduction in choice constitutes a welfare loss (Krutilla et al 1975:43).

3.7.3 The Value of Maintaining Options

Weisbrod (1964) demonstrated that if future users would be willing to pay current users for the option to retain an area or a resource, that might otherwise be irreversibly lost through the process of environmental change, there is value in retaining options. This demand reflects a willingness to pay for retaining an option to use a resource for which there are no close substitutes. Option demand may exist even if there is no current intention to use the resource in question, and even if the option may never be exercised (Krutilla 1967:780). In formalising the concept of option demand Cicchetti & Freeman (1971 in Krutilla et al 1975:70) found that option value was positive for risk-averse individuals, and could thus be regarded as a risk premium. Aside from this consideration, there is value in retaining options if new information about the outcome of alternative decisions could become available in the future - a consideration described as quasi-option value by Arrow & Fisher (1974). In addition, there may be a permanent penalty in forfeiting environmental benefits since their loss results in a new, but lower optimum level of environmental quality (Dohan 1977:161). Thus, considerations of irreversibility, non-substitutability and uncertainty necessitate that actions involving major changes to the environment be approached with

extreme caution (Krutilla et al 1975:73).

Theoretically, the expected benefits of an irreversible decision should be adjusted to reflect the loss of options it entails (Arrow et al 1974:319; Porter 1984:247). It should be noted however, that the concept of option value has been a source of increasingly technical and complex debate. In addition, empirical estimates of option value are fraught with difficulty (Bishop 1982:1, 14). Nonetheless:

> the general moral emerging... is clear enough. When future costs and benefits are uncertain and when current investment decisions are irrevocable, such as that which often happens when environmental resources are exploited, current resource usage ought to be more "conservative" than when decisions are not irrevocable. This is due to the fact that a more "conservative" resource exploitation policy enables the planner to maintain greater flexibility. In the field of resource exploitation there is a very good reason for not doing today something that can be postponed until tomorrow: for tomorrow we shall know more (Dasgupta 1982[b]:200).

Maintaining options and flexibility imposes a cost in terms of reduced efficiency over the short term. The real cost of refraining from converting remaining rare natural environments may, however, not be very great because future technology will provide additional substitutes for conventional natural resources (Krutilla 1967:784). Moreover, it may pay to be somewhat inefficient if a relatively modest investment can forestall large scale environmental disruption (Fisher et al 1974:103). Therefore in the long run, the prevention of problems arising from environmental change may be cheaper than their cure (Kneese 1977:103). Dubos (1972:287) maintains that although efficiency may be an essential criterion of modern technology, man is not a machine. Diversity, not efficiency, is the sine qua non of a rich and creative human life. According to Watt (1972:74) diversity is more than the "spice of life" - it is an

essential element of survival.

> The costs of maintaining natural and near-natural areas may be regarded as foregone opportunities to provide the maximum goods and services which could be produced (given the state of technology) to satisfy culturally-induced needs and the lowest basic needs of present generations. The benefits of maintaining natural and near-natural areas may be regarded as providing future generations with greater prospects for survival and more opportunities to satisfy the higher basic needs. ...[T]he exploitation and conversion of all natural and near-natural areas, most of which have little potential for increased productivity, would not contribute significantly or for long to providing for man's culturally-induced and lowest basic needs, but would increase risks to survival and reduce the prospects of satisfying higher basic needs. If decision-makers are committed to the survival of mankind and to providing for the highest quality of life that society might enjoy, then a policy of maintaining natural and near-natural areas should be adopted in spite of short-term opportunity costs (Stauth 1980:272-273).

3.7.4 Towards a Balance Between the Wilderness, Countryside and City Settings

Since the 1850's, writers such as Thoreau (1962:224-225) have recognised the value of maintaining diverse environmental conditions. Each condition, from wilderness to the city, has special interest for man (Mumford 1946:333). Dixon (cited in Mumford 1946:368) wrote that:

> very often the strength of a culture, its virility and energy, and even its vitality, depends in no small measure on the tenacity of its environmental fibre, as does its richness and brilliance on the number and variety of exotic traits it contains.

According to many writers, wilderness gives meaning and definition to the human enterprise, and wilderness appreciation is one of the marks of a truly civilised, cultivated man (Krutch 1954:312-313; Leopold 1966:279; Abbey 1971:48). The preservation of natural areas is not a

peripheral luxury for society, but a capital investment from which interest can be drawn. The most pleasant and safest environment to live in however, contains a variety of conditions. The true value of the total environment is determined by the dynamic interaction between the developed and natural environment, and not only the worth of each as a separate component (Odum 1969:267-269). A spectrum of environmental conditions, including the opportunity to experience solitude and aesthetic beauty of natural environments may become increasingly important, providing areas of relative stability and peace (UNESCO 1973:15). Quality of life cannot be successfully sought and achieved unless that life is embedded in a well functioning ecosystem and a well functioning social system (Dauvellier 1977:20; Milbrath 1982:16-17). There is thus a need to maintain a balance between the natural, rural and built components of the environment, so that our civilisation should not decline irreversibly under the pressures of unconsidered urbanisation or unbridled preservation (Dix 1984:138).

The underlying rationale for maintaining diverse environmental conditions is oriented towards biohumanism (see Section 3.3.2.1).

> Biohumanism will be difficult either to confirm or refute because of the recalcitrant difficulty in separating the respective roles of heredity and environment in determining behavior and taste. But if we cannot conclude whether or not we have a fundamental constitutional need for wild nature, at least the plausibility and possibility of the biohumanist hypothesis mandates cautious and conservative dealings with nature. If, at length, we conclude that mankind can manage quite well without wilderness, there will be time enough to dismantle it. However, if we should eventually discover that humans do indeed have a deep need to be in the presence of the kind of natural species, landscapes, and ecosystems that produced them, we may arrive at that realization too late to reclaim our natural legacy (Partridge 1984:111).

3.8 Establishing an Integrated Environmental Continuum: An Ideal for Land-use Planning

Planners and decision-makers should strive to maintain a spectrum of environmental conditions, from wilderness to the truly urban city. Although the distinction between culturally-induced and basic needs may be difficult to determine in practice, benefits associated with the wilderness, countryside and city settings may be necessary for meeting man's true, biologically determined needs and for ensuring that social progress is sustainable. These settings describe a continuum of environmental conditions. Wilderness is the "raw material out of which man has hammered the artifact called civilisation" (Leopold 1966:264). Only the wilderness setting is self-supporting, but no one setting should be viewed in isolation. They are interconnected through a flow of material and human resources and services from one to the other (Dauvellier 1977:21-26). In this sense the spectrum of environmental conditions describes more than a continuum: each setting is an integral part of a whole. Establishing an integrated environmental continuum is therefore an ideal towards which planners and decision-makers should strive. Through the protection, development and restoration of the environment, conditions which provide for man's immediate needs and long term well-being may be enhanced, while those that are detrimental may be avoided.

3.9 Conclusion

The process of environmental transformation has caused pervasive, yet uncertain and irreversible impacts that threaten individual, community and social well-being. It is posited that the ideal of establishing an integrated environmental continuum provides a conceptual basis to address the "planner's dilemma". Maintaining diverse environmental conditions accommodates a range of values and attitudes, and is necessary to cater for man's basic needs in

the short and long terms. The issue of appropriate resource use, even at the local scale as in the "Cederberg Controversy", should therefore be seen in the context of an integrated approach to land-use planning and management, based on the protection, development and restoration of a spectrum of conditions from wilderness to the city.

CHAPTER FOUR: TRADITIONAL RECREATION PLANNING APPROACHES

4.1 Introduction

The recreation planner's task has been complicated in recent years by the rapidly changing recreation environment. The balance between more and less developed recreation opportunities has been indirectly altered by the process of environmental transformation. In addition, the rapid increase in the number of visitors over the last few decades, has exerted direct pressures on available opportunities. In South Africa the increase in recreation use has been more than was predicted, and in directions not even imagined a few years ago (Steyn 1980:142; Andrag 1983:358). Recreation planners in this country are now challenged to provide opportunities for growing numbers of visitors who have a variety of desired recreation experiences.

This chapter outlines the nature of recreation, and examines traditional recreation planning approaches in the context of the changing recreation environment. Attention is focussed on the extent to which these approaches provide a basis for addressing the direct and indirect pressures on recreation opportunities.

4.2 The Nature of Recreation

In planning and doing research on recreation in South Africa, the focus of attention has traditionally been on the nature and size of the area designated for recreational use, and/or activities in which people are recorded to have participated, and/or the facilities available or wanted at recreation sites (see e.g. Cape Provincial Administration [CPA] 1973; Proceedings of The First Conference on Recreation Research 1976; Andrag 1977; The International Symposium on Research in Sport and Recreation 1979; Taylor 1984). In the overseas

literature however, a behavioural approach to the study of recreation has increasingly been advocated (see e.g. Driver & Tocher 1970; Hendee 1974; Murphy et al 1977; Driver & Brown 1978). Overseas, this development is seen to be the most significant contribution by social scientists conducting recreation research over the last ten years (Schreyer, Knopf & Williams 1985:9). Several studies in the South African context indicate that there has also been some local recognition of the value of this approach to recreation planning and research (see e.g. Pickles 1978; Sutcliffe 1979).

Driver & Tocher (1970) were early proponents of a behavioural approach to the study of recreation. They sought to explain recreation motivation as an attempt by visitors to fulfill a hierarchy of needs, consistent with the motivation theories of Gutman (1967) and Maslow (1954) (see Section 3.4). Participation in recreation is seen to provide opportunities for attaining higher order needs such as learning, problem solving, creativity and self-actualisation. By understanding these needs, it is posited that recreation planners will be better able to provide opportunities which produce experiences meeting visitor goals (Murphy et al 1977:30-33). Moreover, recreation opportunities can then be seen in the context of other need gratifiers. The behavioural approach highlights that experiences obtained from recreation engagements are the key product of management efforts, rather than the traditional considerations of area, activities, facilities or participation rates. Without a clear specification of the experiences visitors desire, it will be difficult to place a value on recreation, adequately plan for it, or effectively manage recreation resources (Driver & Brown 1978:29).

In developing a behavioural approach to the study of recreation, Driver and Tocher (1970:10-29) describe 5 postulates:

(1) Recreation is an experience that results from recreational engagements. Recreation is viewed as a goal-directed process. It is postulated that there are psychological and physiological drives which motivate visitors to participate in recreation activities to derive recreation experiences.

(2) Participation in recreation requires a commitment by the visitor in terms of time, energy and personal resources.

(3) Participation in recreation is self-rewarding. Recreation is an end in itself. Goal-objects are therefore pursued for their own sake and produce net positive recreation experiences.

(4) Participation in recreation involves personal and free choice. This has three important implications for planners:

  (i) There should be an array of opportunities from which to choose.

  (ii) Visitors should be free and able to make this choice.

  (iii) Visitors should be free and able to participate once this choice is made.

(5) Participation in recreation occurs during non-obligated time.

In order for visitors to achieve satisfactory experiences, the recreation planner's responsibility extends from motivations to the attainment of the desired experiences and benefits (Jubenville 1976:4). The nature of the recreation experience was initially highlighted by Clawson (1963) and Clawson & Knetsch (1966). They described the recreation experience as comprising five distinct chronological phases:

(1) ANTICIPATION - envisaging and planning the trip
(2) TRAVEL TO - getting to the recreation site
(3) ON-SITE EXPERIENCE - engaging in the recreation activity
(4) RETURN TRAVEL- returning home
(5) RECOLLECTION - recalling the experience

Recreation thus extends beyond the on-site experience and becomes an integral part of the visitor's experience of life. By meeting higher-order needs, recreation contributes to the growth and development of the individual and therefore to the well-being of society (Driver & Tocher 1970:29; Kelley 1983:8-11).

A dominant theme in recreation research has been that people have a diversity of recreation preferences and needs (see e.g. Clark, Hendee & Campbell 1971; Stankey 1973; Brown & Haas 1980). The "Cederberg Controversy" highlighted a variety of recreation preferences in the South African context (see Section 2.4.1). Providing a spectrum of recreation opportunities, to enable people to attain their desired experiences and hence benefits, has become a central postulate in recreation planning (Driver & Brown 1978:27; Brown, Driver & McConnell 1978:79; Clark & Stankey 1979[a]:26; Stankey & Brown 1981:65). But a major limiting factor to providing a full spectrum of recreation opportunities, is that recreation planning needs to be done in the context of other land-use activities. As shown in the history of the Cederberg (see Chapter 2) and elsewhere (see e.g. Clark & Stankey 1979[a]:preface), these activities can cause indirect modification that reduces the diversity of available recreation opportunities.

The question then arises of: "To what extent do traditional recreation planning approaches provide a suitable basis for dealing with the growing direct and indirect pressures on recreation resources, and the need to maintain a diversity of recreation opportunities?"

Recreation planning approaches have been formulated and adapted in response to the increasing pressures on recreation opportunities. Although numerous specific recreation planning techniques or methods have been developed, many of them can be considered under one of the three broad approaches

discussed below. These approaches outline a progression in the development of recreation planning.

4.3 Single-Site Demand-Centred Approach

The initial management response to increasing visitor use is often an attempt to cater for all the demands made on the recreation site. Access may be improved and facilities provided in an effort to maintain visitor satisfaction. This approach assumes that planning starts with the site and that facility development will satisfy visitors. The manager is assumed to be responsible for recreation experiences and an attempt is made to manipulate the site or visitors, to produce a socially desirable outcome (Jubenville et al 1983:304-305).

The 1936 Department of Forestry policy for recreation in the Cederberg, provides early evidence of the use of the single-site demand-centred approach in South Africa. The more recent ad hoc establishment of facilities in the Cederberg reflects the continued use of this approach to recreation planning (see Section 2.2.2). In Great Britain there was considerable growth in outdoor recreation in the 1960's. To meet public demand, and to extend opportunities to as many people as possible, "compatible facilities" were provided. These facilities attracted more visitors. In many areas the result was over-crowding. By simply providing facilities to meet visitor demands it would seem that:

> [the] balance has shifted from enjoyment of the countryside to entertainment within it. In that context many country parks offer a chance not so much to gain unfettered access to the countryside as to partake of yet another leisure "attraction" where the countryside element becomes almost incidental (Patmore 1983:199).

Basing planning decisions on aggregate demand at a particular site results in the incremental modification of opportunities

originally available to visitors at that site. This alteration of recreation opportunities can be compounded by new managers to the site, who may feel obliged to continue the general course followed by previous managers, yet make additional changes to reflect their own "management style" (Jubenville et al 1983:304-305). In attempting to accommodate continually rising demands, the site is treated as a common property resource, i.e. access is unrestricted, but external costs are often not anticipated. Once crowding effects become apparent however, these costs can rise precipitously (see Section 2.3.1). As conditions change, it is likely that new visitors will be attracted to the site. These visitors may even demand additional changes to the prevailing opportunities. If management responds to such demands, visitors who were initially attracted to the site will find the changes inconsistent with their previous experiences and may be forced to move to another area. If suitable alternative opportunities are not available elsewhere, they may then be forced to adapt to the changing conditions and accept a less satisfying recreation experience. This could constitute a significant cost to visitors because of the importance of authenticity in some recreational experiences (Krutilla et al 1975:100). This process of "displacement and succession" is apparent in the Cederberg (see Section 2.3.3).

The single-site demand-centred approach does not provide a satisfactory basis for recreation planning. Managers merely respond to demands by providing additional facilities. The net effect may be a continual modification of recreation opportunities. This process may be exacerbated by indirect pressures associated with environmental transformation. In a regional context, the result may be a collection of unrelated sites that fail to fulfill the potential of the recreation resource base. In addition to conflicts with extensive non-recreation land-use practices, the diversity of available recreation opportunities may be reduced. Since visitor preferences and needs vary, increasing homogeneity of

recreation opportunities will diminish the total social benefit to be derived from recreation (Dustin & McAvoy 1982:54-55).

4.4 Single-Site Inherent-Capability Approach: Recreation Carrying Capacity

When managers or planners recognise conflict between visitors, or perceive the site to be "over-crowded", the single-site demand-centred planning approach tends to be replaced by the single-site inherent-capability approach. This approach consists of an attempt to disperse visitors, or to reduce use to former levels. A considerable body of literature has built up over the years that seeks to provide a framework for determining the optimal amount of recreation use for a site. The underlying concept of this approach is recreation carrying capacity (see e.g. Stankey & Lime 1973; Stankey & McCool 1984).

Recreation carrying capacity is generally seen to consist of two interrelated aspects, namely ecological and social carrying capacity (Stankey 1974:84; Stankey 1980:6-7). The central idea is that beyond a certain level of use, ecological impacts may be judged to be unacceptable. Increasing use beyond a certain level will also adversely affect the recreation experiences associated with that opportunity.

Despite extensive research on recreation carrying capacity, the concept has not been very successfully implemented (Washburne 1982:726; Stankey & McCool 1984:466). In order to adequately address issues of importance to recreation planning and management, attention needs to be reoriented from the question of "How much use is too much?" to the question posed by Wagar (1974:278) of "What management patterns, including kinds and amounts of use, will permit a recreation site to make its maximum contribution to the

sustained benefit provided by the whole system of recreation sites?". This question gives rise to other complex questions, such as: "For what alternative opportunities and levels of use are the physical characteristics of the sites suited?"; and "How can the management of one site be co-ordinated with that of other sites?". A single carrying capacity standard for a specific site will obviously not resolve these complex questions. Moreover, a search for a capacity number may distract planners from deciding what recreation conditions are acceptable, and then devising standards that will clearly maintain such conditions. Rather than focussing on the number of visitors, planners should concentrate on the underlying conditions desired, and the appropriate management actions for an area, which may or may not involve reductions in use (Washburne 1982:728). Carrying capacity remains a subjective judgement that should be guided by information regarding visitor desires, site capabilities and alternative recreation opportunities (Wagar 1974:278).

There is growing consensus that carrying capacity should be viewed as a management concept that can assist in achieving the maintenance or restoration of ecological and social conditions defined as acceptable and appropriate in management objectives. It is now widely acknowledged that carrying capacity should not be directed toward the manipulation of use levels _per se_ (see e.g. Lime 1976; Schreyer 1976, 1979; Brown 1977; Heberlein 1977; McCool 1977; Shelby 1981; Gramman 1982; Stankey & McCool 1984). The carrying capacity concept has recently been reformulated to resolve misconceptions surrounding the concept and to address the limitations of previous applications (see Section 4.4).

The single-site inherent-capability approach was applied in the Cederberg in the late 1970's (see Section 2.3.2). Restrictions on visitor numbers and activities were introduced to prevent or minimise ecological degradation and adverse impacts on visitor experiences. A standard maximum

number of visitors, selected as depicting the appropriate carrying capacity for all wilderness areas in South Africa, was applied in the Cederberg. This standard attempts to provide an absolute measure for all wilderness areas, and is apparently directed at the question of "How much use is too much?".

Adequate attention does not appear to have been given to the relationship between the carrying capacity of wilderness areas and other recreation opportunities in the region. The result of the prevailing approach may be stereotyped recreation opportunities which are un-responsive to visitor needs and costly to administer (Jubenville 1976:19-20). More comprehensive applications of the carrying capacity concept have been made by Sowman (1984, 1987) in the context of coastal recreation in South Africa. Sowman's (1987) procedure for evaluating coastal recreation development proposals is however, project- and site- specific, and therefore does not provide a basis for addressing the question of "What management patterns, including kinds and amount of use, will permit a recreation site to make its maximum contribution to the whole system of recreation sites?". An additional limitation of the procedure results from the use of on-site cross-sectional surveys which have an inbuilt "Guaranteed Success Syndrome" effect (Jubenville et al 1983:313).

4.5 The Need for Comprehensive Recreation Planning

In South Africa and elsewhere, recreation planning has traditionally been fragmented, with individual sites developed in isolation of each other. There has been little concern for the effect of such incremental development on the system of recreation opportunities as a whole, despite the continuous call for a comprehensive approach to recreation planning (see e.g. Gould 1961; Outdoor Recreation Resources Review Commission [ORRRC] 1962; Wagar 1974).

> The integrated approach to recreational provision... has been too often neglected by both researchers and providers. There is no sharp discontinuity between urban and rural resources for recreation, but rather a complete continuum from local park to remote mountain peak. To the user, the distinction is as much one of distance as locale:... town walk and country walk differ in degree rather than in kind" (Patmore 1983:122).

Consequently there is a need to adopt a more comprehensive planning approach that seeks to achieve a balance of opportunities along a recreation continuum (Lloyd & Fischer 1972:3-4).

4.6 Comprehensive Demand-Capability Approach

The influence of economics in early recreation research was reflected in the initial development of comprehensive recreation planning (see e.g. Clawson 1963). Consideration was given to reconciling visitor demands with the available supply of recreation opportunities in order to achieve a socially optimal result (see e.g. McClellan & Medrich 1969). As attention was drawn to the limited supply of recreation sites, and hence the notion of recreation carrying capacity, there was a shift from the demand-supply approach to a demand-capability approach.

The comprehensive demand-capability approach relates the capability of sites to support recreation use to visitor demand, so as to highlight what opportunities should be provided where. It is posited that where demand exceeds capability, additional recreation opportunities are required. A typical comprehensive demand-capability approach is reflected in the Canadian Outdoor Recreation Demand Study (CORD) (Canadian Land Inventory 1969). CORD focussed on the question of "What is the capability of the land for certain recreation activities?" Based on a subjective judgement of the ability of an area to support various recreation activities, and according to physical characteristics, land

units are grouped together to indicate their suitability for recreation activities ranging from high to very low capability. The Scottish recreation planning approach developed by Coppock & Duffield (1975) has many similarities to the CORD approach.

4.6.1 Comprehensive Recreation Planning in South Africa

A comprehensive demand-capability approach has been developed on a national scale in South Africa through a research programme aimed at producing a National Outdoor Recreation Plan (NORP). The aim of the research programme has been to develop a framework within which recreation planning and research in South Africa can be conducted. The primary concern is the provision of a recreation infrastructure designed to meet the needs of all the inhabitants of South Africa (DPE 1978:1). The long term objectives of the research strategy are to:

(1) Identify priority demand core areas and their peripheral zones.
(2) Evaluate demand and preference data in selected priority core areas.
(3) Assess the socio-economic structure and patterns of recreation.
(4) Delineate recreational hinterlands and identify usage/quality thresholds.
(5) Develop a recreation planning strategy (DPE 1978:6).

The major short term objectives comprise:

(1) A survey and analysis of demand and preference patterns.
(2) A survey and analysis of terrain capabilities.
(3) A study of the recreation-facility and resort infrastructure in South Africa to gauge the quantity and quality of the infrastructure to be provided (DPE 1978:1).

Work on the short term objectives is nearing completion and will provide a data base on which a comprehensive recreation planning approach, relating demand-core and resource-core areas, can be founded (Butler-Adam, pers. comm.; Steyn, pers. comm.).

4.6.2 Limitations of the Comprehensive Demand-Capability Approach

Concern has been expressed about several limitations of existing comprehensive demand-capability recreation planning approaches.

4.6.2.1 The Definition and Measurement of Demand

Particular attention has been focussed on the inadequacy of definitions and measurements of demand. Demand for recreation opportunities is often equated to consumption, i.e. gross recreation participation at available sites. Such participation figures do not only reflect demand, but also reflect opportunity and are the net effect of existing demand and existing supply (Clawson *et al* 1966:115-116). Participation figures ignore potential visitor preferences or latent demand. Estimating demand on the basis of participation figures also yields little information about possible changes in the structure of experience definition and/or visitors over time. Participation figures may not distinguish between the different ways in which people undertake activities. (Compare for example, the various styles of camping which range from that based on the minimum of equipment and no support facilities, to that involving vehicles, caravans and comprehensive facilities.) Ignoring this distinction limits data that is related to the supply of recreation opportunities because different opportunities are needed for different styles of activity (Stankey, Brown & Clark 1983:227).

The assumption that participation is an adequate surrogate for demand could result in the erroneous conclusion that people will demand increasing quantities of recreation opportunities they already have. This conclusion may lead to the provision of additional opportunities that are already in adequate supply, rather than providing for deficient opportunities. Existing imbalances in available recreation opportunities will therefore be exacerbated (Clawson et al 1966:116). Nonetheless, the myth persists that somehow population figures can be multiplied by recreation activity participation rates to produce a measure of demand.

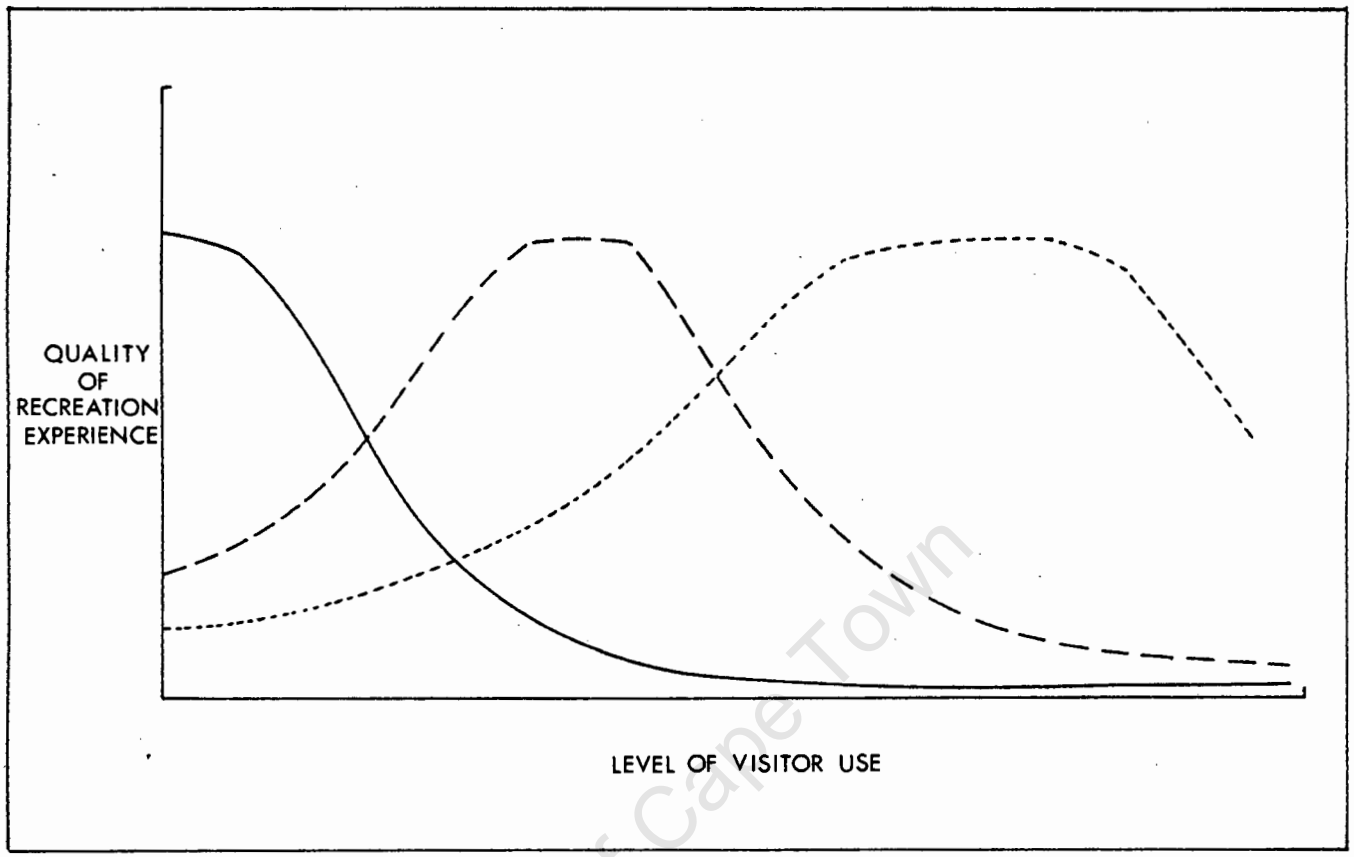
A recent study of recreation among whites in the Cape metropolitan area by Taylor (1984), demonstrates the limitations of research based on a poorly defined and measured concept of demand. This study sought to determine recreation demands and to relate these to the resource supply potential of the surrounding area. Although it was acknowledged that existing participation cannot be equated to demand, participation was still considered to be a good indicator of demand for recreation resources (Taylor 1984:13-15, 17). This assumption resulted in a number of spurious statements. For example, given the relatively low participation in "mountain recreation" compared to "coastal recreation", and given that the region is richly endowed with mountain recreation areas, it was said that it is not very likely that crowding will occur in mountain areas (Taylor 1984:23). Historical patterns of recreation use in the Cederberg however, provide clear evidence of crowding (see Section 2.2.2). Furthermore, it was said that people who visit mountain areas do not really want development, but usually prefer a wilderness area (Taylor 1984:23-24). This statement completely ignores the fact that latent demand is not reflected in existing participation patterns. There is evidence that some visitor groups would consider development of the currently undeveloped area of the Cederberg, for example, to be appropriate (see Section 6.5). If such

development were to be undertaken it is likely to be well used. Equating participation with demand would then lead to the opposite conclusion, namely that visitors to mountain areas prefer development.

The difficulty of determining visitor demand for recreation opportunities is recognised by the leading researchers in the NORP. Particular difficulties have been encountered in assessing the recreation demand among blacks. Considerable effort will still have to be given to this issue before the results of the NORP demand-preference surveys can be effectively used for recreation planning (Steyn, pers. comm.).

4.6.2.2 Linking Recreation Quality and Resource Capability

Attempts to relate resource capability to recreation quality has been a limitation of some comprehensive demand-capability approaches. Recreation quality is described as a "conceptual sand castle". It is a notion just clear enough to be embraced as a goal and fuzzy enough to go unchallenged as to its meaning (La Page 1983:277). Perceptions of recreation quality will vary among visitors. Resources with a low capability to support recreation use, such as a wilderness area, can provide the visitor with a high quality recreation experience. Similarly a highly developed campground or an amusement park that can sustain high levels of use, can also provide high quality recreation experiences to visitors (see Figure 5, page 70). Therefore the view that quality is highest at low levels of use, and that it falls steadily as use intensity rises (as posited by Clawson *et al* 1966:167), is not valid. Similarly, recreation quality should not be seen to increase in proportion to levels of use (as implied in the NORP terrain capability classification [Department of Environmental Planning and Energy 1980:2, 6]). Quality should be seen as existing along a spectrum of recreation opportunities (Clark & Stankey 1979[a]:5).



KEY: WILDERNESS: ———— AMUSEMENT PARK: ·····
HIGHLY DEVELOPED CAMPSITE: – – – –

FIGURE 5: THE INFLUENCE OF LEVELS OF USE ON THE QUALITY OF RECREATION EXPERIENCES ATTAINED BY VISITORS

4.6.2.3 Inadequate Interpretation of Data

Some comprehensive demand-capability studies in the United States have been found to have a low ratio of "effort expended on data analysis : data collection" and an even lower ratio of "time spent on data interpretation : data collection" (Westfall & Hoffman 1983:363). Data of this nature has therefore been too general to be of value in resolving problems relating to particular recreation sites or areas. In addition, data collected by researchers may not be in a readily usable form for planners. This particular

difficulty has also been encountered by planners conducting recreation planning in the Cape Province when attempting to use the NORP data on recreation facilities and resort infrastructure (Theunissen, pers. comm.).

4.6.2.4 Ignoring the Results of Behavioural Research

Advances in knowledge of recreation as a result of behavioural research have seldom been incorporated into comprehensive demand-capability planning approaches. This knowledge could however, be relatively easily incorporated into some approaches, such as CORD (Brown, Driver & McConnell 1978:78). It is not immediately apparent whether the results of behavioural research could be effectively incorporated into the NORP ex post facto. This concern demands particular attention, given the value of adopting a behavioural approach to recreation planning (see Section 4.2).

4.6.2.5 Viewing Recreation in the Context of Other Land-use Practices

Few comprehensive demand-capability approaches give explicit attention to the indirect impacts of other land-use activities on the nature of recreation opportunities. Over time, recreation opportunities can be considerably altered by changes in these activities, as evidenced in the Cederberg. The need to conduct recreation planning in the context of other land-use practices is explicitly recognised in the NORP (DPE 1978:1). But no specific details have been provided to indicate how this is to be achieved. Although recreation planners have little control over these indirect pressures, it is vitally important that a recreation planning framework enables the planner to take them into account.

The foregoing limitations do not justify rejecting a comprehensive approach to recreation planning. With increasing demand for all types of recreation opportunities,

conflicts tend to become polarised into "either-or" terms. In South Africa, different social classes, occupational and age groups, races and so on, show different patterns of recreation behaviour (see e.g. Steyn 1980; Taljaard 1983). Efforts should be made to allow for divergent life styles and modes of expression. Attention should therefore be focussed on how to achieve balance across a full array of recreation opportunities, from highly developed, concentrated opportunities, to very primitive, dispersed opportunities (Lloyd et al 1972:3). By recognising the plurality of human needs and preferences, recreation management agencies will be better able to facilitate their fulfillment (Murphy et al 1977:34-37, 42-55, 215).

4.7 Conclusion

Planning is a process dealing with present conditions and future needs. A planning framework has to make allowance for flexibility and revision given the evolution of new socio-economic concerns and technological changes. Planning should therefore involve the most informed opinion, from all concerned parties, and be subject to periodic review (Brockman & Merriam 1979:239-240).

Traditional recreation planning approaches have not provided a suitable framework to cater for diverse visitor preferences and needs in a changing environment. Attention needs to be directed towards an understanding of how social, physical, biological and management systems relate to recreation; to the relationship between recreation and non-recreation use; and to the spatial and temporal distribution of recreation opportunities and use (Clark 1982:10). The recently developed ROS concept provides a framework for addressing these issues.

CHAPTER FIVE: THE RECREATION OPPORTUNITY SPECTRUM CONCEPT

5.1 Introduction

The ROS concept provides a framework for systematic provision of diverse recreation opportunities. According to the ROS concept, a recreation opportunity is defined as the availability of a real choice for a visitor to participate in a preferred activity, within an appropriate setting, to realise satisfying experiences (USDA, FS 1986 Part II:29). By addressing many of the shortcomings of traditional recreation planning approaches, the ROS concept demonstrates considerable potential for planning recreation in South Africa.

5.2 Historical Development

Marshall (1933) was one of the earliest proponents of a planning approach that provides quality recreation opportunities across the entire spectrum of settings, activities and experiences. Wagar (1951:434) also appealed for a comprehensive system of recreation opportunities ranging from the "flower pot at the window" to the wilderness. Diversity was seen to be necessary to cater for varied tastes, to appeal to varying abilities, and to spread use in a manner least harmful to the system of recreation opportunities. From the 1960's increasing numbers of writers urged for the provision of a range of recreation opportunities. Carhart (1961) proposed an integrated zoning system, from primitive to developed opportunities, that roughly corresponds to the modern ROS concept in terms of use and management criteria.

> Outdoor recreation requires the use of a broad range of resources in varying combinations, from intensively developed sites providing diversified recreation opportunities for large numbers of

> people, to undisturbed primitive areas providing enjoyment for limited groups. Between the extremes are areas of various types that have been or may be modified by man. Some are developed solely for recreation and others are managed for recreation in conjunction with other resource uses (Outdoor Recreation Resources Review Commission [ORRRC] 1962:95).

A series of reports by the ORRRC led to programmes aimed at providing a broad spectrum of recreation opportunities. Wagar (1963) proposed a classification system for campground areas to meet the full spectrum of visitor preferences and needs. This classification became a forerunner to the modern ROS concept.

The need to view wildland areas and parks in the context of a continuum of recreation opportunities, from primitive to developed conditions, became firmly established in the 1970's (see e.g. Watson & Smith 1971; Lloyd et al 1972; Potter, Hendee & Clark 1973; Crowe 1974; McCool & Elmer 1975; Field 1976). A major challenge facing recreation resource administrators and managers from the early 1970's was the development of a planning framework that ensured the maintenance of a spectrum of recreation opportunities (Stankey 1974:82-83).

> To prevent all opportunities from being reduced to the lowest common denominator, and to prevent rare and unique opportunities from being converted to conditions that are already abundant, the obvious solution is to create an integrated and highly visible system of areas and zones. Such a system, by providing alternatives for visitors who might invade some zones with conflicting uses, can protect diversity and opportunities for diverse desires (Wagar 1974:276).

The ROS concept was developed in the late 1970's to meet this challenge (Brown, Driver, Bruns & McConnell 1979; Driver & Brown 1978; Clark & Stankey 1979[a]; 1979[b]).

5.3 The Rationale

5.3.1 Establishing a Comprehensive Framework

The purpose of the ROS concept is to provide a framework for policy-makers, planners and managers to resolve questions of recreation opportunity allocation and management. It provides a framework for integrating recreation and non-recreation use and for identifying trade-offs associated with alternative management actions (Clark & Stankey 1979[a]:1). The basic premise of the ROS concept is that a spectrum of recreation opportunities should be provided to fulfill the diversity of preferences and needs that underlie participation in outdoor recreation (Clark & Stankey 1979[a]:1-2; Stankey 1979:141; Stankey & Brown 1981:65; Buist & Hoots 1982:84). The fundamental issue facing planners is to establish balance across the entire spectrum (Stankey 1979:141). The ROS concept is not a panacea for the ills of recreation planning. Rather, it is a management objective: a way of describing and providing a variety of recreation opportunities (USDA, FS 1986 Part I:1).

The ROS concept constitutes a regional approach to recreation planning and aims at providing broad guidelines for site- and project-level planning and management. The concept is based on general recreation principles and is not bound by particular agencies or limited to the provision of particular opportunities. Tables 1, 2 and 3 (pages 76-78) outline activities, settings and experiences associated with different recreation opportunities, as defined by the USDA, Forest Service.

Recreation opportunities are a function of visitor preferences; and a product of management actions to provide desired settings, and to make people aware of their existence. The value of an opportunity is a function of the perceived ability of that opportunity to fulfill the

preferences and needs of the visitor (Clark & Stankey 1979[a]:1-2).

TABLE 1: ROS ACTIVITY CHARACTERISATION
(After: USDA, FS 1986 Part II:31)

PRIMITIVE	SEMI-PRIMITIVE NON-MOTORIZED	SEMI-PRIMITIVE MOTORIZED	ROADED NATURAL	RURAL	URBAN
LAND BASED:	LAND BASED:	LAND BASED:	LAND BASED:		
Viewing Scenery	Viewing Scenery	Viewing Scenery	Viewing Scenery		
Hiking and Walking	Automobile (off-road use)	Viewing Activities	Viewing Activities		
Horseback Riding	Motorcycle and Scooter Use	Viewing Works of Humankind	Viewing Works of Humankind		
Tent Camping	Hiking and Walking	Automobile (includes off-road use)	Automobile (includes off road use)		
Nature Study	Horseback Riding	Motorcycle and Scooter Use	Motorcycle and Scooter Use		
Mountain Climbing	Camping	Train and Bus Touring	Train and Bus Touring		
	Nature Study	Aerial Trams & Lift Use	Aerial Trams & Lift Use		
	Mountain Climbing	Hiking and Walking	Hiking and Walking		
		Bicycling	Bicycling		
		Horseback Riding	Horseback Riding		
		Camping	Camping		
WATER BASED:	WATER BASED:	Picnicking	Picnicking		
Canoeing	Boating (powered)	Resort Lodging	Resort Lodging		
Other Water-craft (non-motorized)	Canoeing	Recreation Cabin Use	Recreation Cabin Use		
Swimming	Sailing	Nature Study	Nature Study		
Fishing	Other Boating	Mountain Climbing	Mountain Climbing		
	Swimming		Team Sports		
	Fishing		Individual Sports		
			Games and Play		
		WATER BASED:	WATER BASED:		
		Tour Boat & Ferry Use	Tour Boat & Ferry Use		
		Boat (powered)	Boat (powered)		
		Canoeing	Canoeing		
		Sailing	Sailing		
		Other Water-craft use	Other Water-craft use		
		Swimming & Waterplay	Swimming & Waterplay		
		Waterskiing & Watersports	Waterskiing & Watersports		
		Fishing	Fishing		

TABLE 2: ROS SETTING CHARACTERISATION

(Source: USDA, FS 1986 Part II:32)

PRIMITIVE	SEMI-PRIMITIVE NON-MOTORIZED	SEMI-PRIMITIVE MOTORIZED	ROADED NATURAL	RURAL	URBAN
Area is characterized by essentially unmodified natural environment of fairly large size. Interaction between users is very low and evidence of other users is minimal. The area is managed to be essentially free from evidence of human-induced restrictions and controls. Motorized use within the area is not permitted.	Area is characterized by a predominantly natural or natural-appearing environment of moderate-to-large size.a Interaction between users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but are subtle. Motorized use is not permitted.	Area is characterized by a predominantly natural or natural-appearing environment of moderate-to-large size. Concentration of users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but are subtle. Motorized use is permitted.	Area is characterized by predominantly natural-appearing environments with moderate evidences of the sights and sounds of man. Such evidences usually harmonize with the natural environment. Interaction between users may be low to moderate, but with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is provided for in construction standards and design of facilities.	Area is characterized by substantially modified natural environment. Resource modification and utilization practices are to enhance specific recreation activities and to maintain vegetative cover and soil. Sights and sounds of humans are readily evident, and the interaction between users is often moderate to high. A considerable number of facilities are often provided for special activities. Moderate densities are provided far away from developed sites. Facilities for intensified motorized use and parking are available.	Area is characterized by a substantially urbanized environment, although the background may have natural-appearing elements. Renewable resource modification and utilization practices are to enhance specific recreation activities. Vegetative cover is often exotic and manicured. Sights and sounds of humans, on-site are predominant. Large numbers of users can be expected both on-site and in nearby areas. Facilities for highly intensified motor use and parking are available with forms of mass transit often available to carry people throughout the site.

TABLE 3: ROS EXPERIENCE CHARACTERISATION
(Source USDA, FS 1986 Part II:33).

PRIMITIVE	SEMI-PRIMITIVE NON-MOTORIZED	SEMI-PRIMITIVE MOTORIZED	ROADED NATURAL	RURAL	URBAN
Extremely high probability of experiencing isolation from the sights and sounds of humans, independence, closeness to nature, tranquility, and self-reliance through the application of woodsman and outdoor skills in an environment that offers a high degree of challenge and risk.	High, but not extremely high, probability of experiencing isolation from the sights and sounds of humans, independence, closeness to nature, tranquility, and self-reliance through the application of woodsman and outdoor skills in an environment that offers challenge and risk.	Moderate probability of experiencing isolation from the sights and sounds of humans, independence, closeness to nature, tranquility, and self-reliance through the application of woodsman and outdoor skills in an environment that offers challenge and risk. Opportunity to have a high degree of interaction with the natural environment.Opportunity to use motorized equipment while in the area.	About equal probability to experience affiliation with other user groups and for isolation from sights and sound of humans. Opportunity to have a high degree of interaction with the natural environment. Challenge and risk opportunities associated with more primitive type of recreation are not very important. Practice and testing of outdoor skills might be important. Opportunities for both motorized and non-motorized forms of recreation are possible.	Probability for experiencing affiliation with individuals and groups is prevalent, as is the convenience of sites and opportunities. These factors are generally more important than the setting of the physical environment. Opportunities for wildland challenges, risk-taking, and testing of outdoor skills are generally unimportant except for specific activities like downhill skiing, for which challenge and risk-taking are important elements.	Probability for experiencing affiliation with individuals and groups is prevalent, as is the convenience of sites and opportunities. Experiencing natural environments, having challenges and risks afforded by the natural environment, and the use of outdoor skills are relatively unimportant. Opportunities for competitive and spectator sports and for passive uses of highly human-influenced parks and open spaces are common.

A principle goal of the ROS concept is to prevent recreation conflict by forward planning. The specification of standards of appropriate conditions for an opportunity, gives managers a rational basis for resolving conflicts (Clark & Stankey 1979[a]:17). Providing a diversity of opportunities expands meaningful choice and increases the possibility that most people will be able to find quality recreation now and in the future.

It has long been recognised that recreation quality is a highly personalised matter (see e.g. Wagar 1966; Lloyd et al 1972; Potter et al 1973). Quality depends on what the visitor seeks, and to what extent desired experiences and benefits are realised. The ROS concept describes opportunities that exist, and identifies and caters for alternative opportunities that may be desired and can be provided for along the spectrum (USDA, FS 1986 Part IV:29-30). The ROS therefore does not represent a quality continuum. Opportunities are a function of visitor preference and primarily a product of management actions that influence the kind of setting provided (i.e. the combination of physical, biological, social and managerial conditions that give value to a place). Quality is reflected in the extent to which the setting satisfies the desire of a particular visitor. Quality is not reflected in the level of some setting attribute (such as available facilities) (Clark & Stankey 1979[a]:5).

Diversity between and within recreation opportunities is necessary to cater for the range of desired experiences and benefits. Without diverse recreation opportunities charges of favouritism, elitism and discrimination could be levelled at recreation planners. The diversity of recreation opportunities will be expanded if the ROS is provided in all environments (Clark & Stankey 1979[a]:16). Diversity also maintains flexibility to accommodate changes in the recreation system, given social or technological changes (Clark & Stankey 1979[a]:5). Diversity is thus a means to an

end: quality recreation opportunities is the desired goal. Developing the basic premise of providing diverse recreation opportunities, the ROS concept aims to provide opportunities for people to participate in preferred activities, in appropriate settings, and hence to obtain desired experiences and benefits (Clark & Stankey 1979[a]:26; Buist et al 1982:84).

5.3.2 The Link Between Settings, Activities and Experiences

The ROS concept provides a framework for defining a series of linkages and relationships between recreation settings, activities and experiences and how these are affected by and affect management and visitors (see Figure 6).

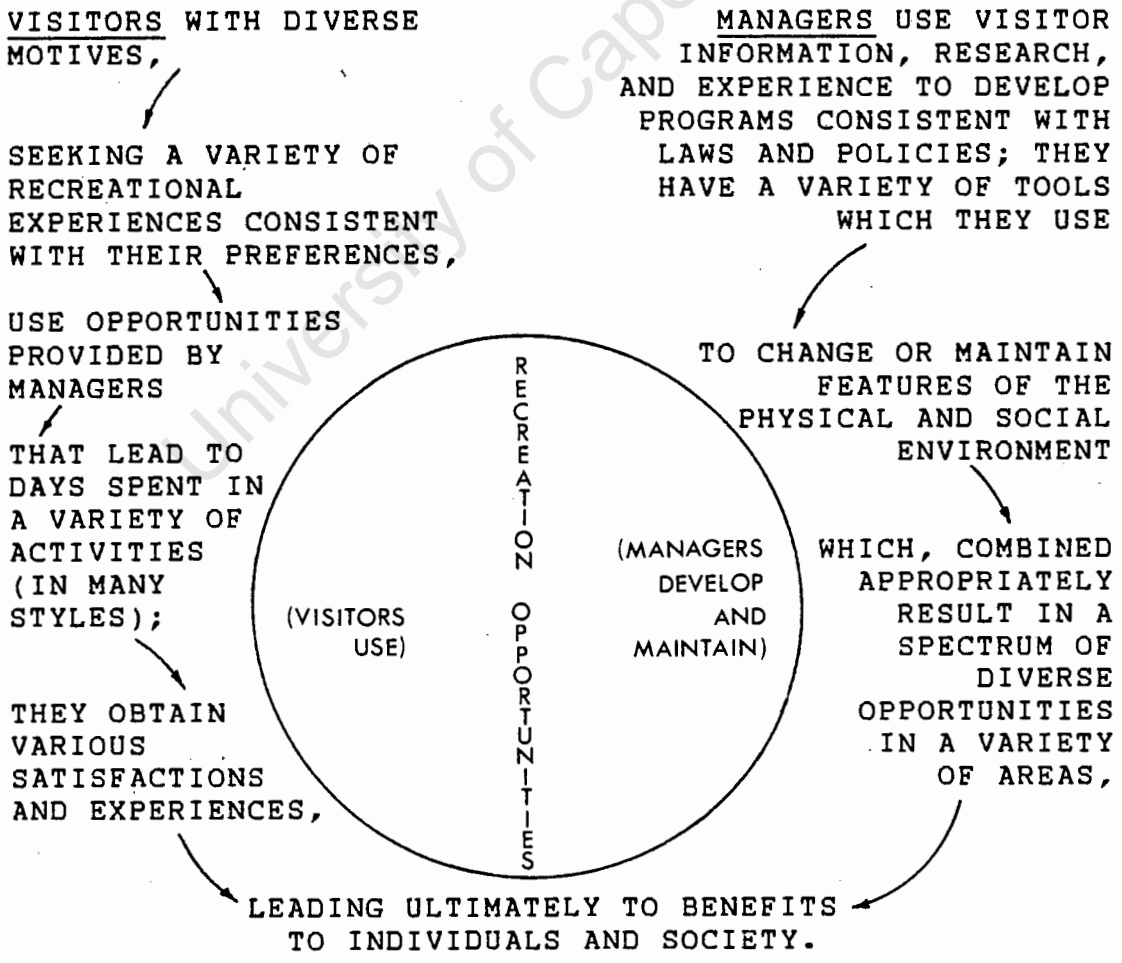


FIGURE 6: THE LINK BETWEEN VISITOR DEMANDS AND THE OPPORTUNITIES PROVIDED BY MANAGERS
(After: Clark & Stankey 1979[a]:6)

Based on the work of Driver & Brown (1975, 1978), the ROS is conceptually defined in terms of the needs of visitors, and is rendered operational by their preferences for recreation activities, for specific features of settings, and for specific experiences and benefits.

Recreation opportunities are distinguished according to four hierarchical levels of demand or preference, namely:

(1) The opportunity to participate in preferred recreation activities.
(2) The opportunity to experience the conditions that define the setting appropriate for a particular activity.
(3) The opportunity to experience certain psychological outcomes from participation in a particular activity in an appropriate setting. These psychological outcomes, or recreation experiences, may be "bundles" of several separate experiences that underlie participation in a particular activity in a certain setting.
(4) The opportunity to realise various benefits from the experiences in level 3. This may be reflected as improved individual or social well-being (Driver & Brown 1978:25-27).

Visitor demand is thus viewed as a process based on individual personality characteristics, motivational aspects and available opportunity choice sets. The position along the ROS is defined in terms of the relationships between the demands of levels 1, 2 and 3 (Driver & Brown 1978:28). According to (Clark & Stankey 1979[a]:7) the application of the ROS concept is not contingent on an understanding of the quantitative links between settings, activities and experiences. The concept can be used to provide specific information to potential visitors about what a place is like, rather than what experiences they will necessarily derive. The provision of such information is considered to be critical because the use of an area is partly a function of

the information visitors possess (Patmore 1983:235-237).

5.3.3 A Focus on the Recreation Setting

Clark & Stankey (1986:509) maintain that knowing the importance visitors attach to particular attributes of recreation settings is the foundation of effective recreation management. The recreation setting includes conditions of nature (such as landscape and vegetation), conditions associated with recreation use (such as levels and types of use) and conditions provided by management (such as infrastructure and regulations). Attention is focussed on the recreation setting because this component of the recreation opportunity can best be manipulated by management to influence visitor experiences. The setting is where use occurs, and the attributes of the setting can facilitate or hinder management and visitor satisfaction. It is explicitly recognised that this focus is only a means to an end: the setting is the medium in which activities are undertaken and experiences produced (Stankey & Brown 1981:65; Stankey, Brown & Clark 1983:228; McCool, Stankey & Clark 1985:1; USDA, FS 1986 Part III:38-39).

Setting attributes must be measurable and observable; directly under management control; related to recreation preferences and have an influence on decisions about the use of recreation opportunities; and be characterised by a range of conditions (Clark & Stankey 1979[a]:8). Figure 7 (see page 83) outlines setting attributes that were selected to distinguish positions along the ROS by the USDA, Forest Service. Alternative combinations of these attributes describe different recreation settings. It is emphasised that a position along the spectrum is determined by a specific combination of attributes and not by a particular name or number of settings.

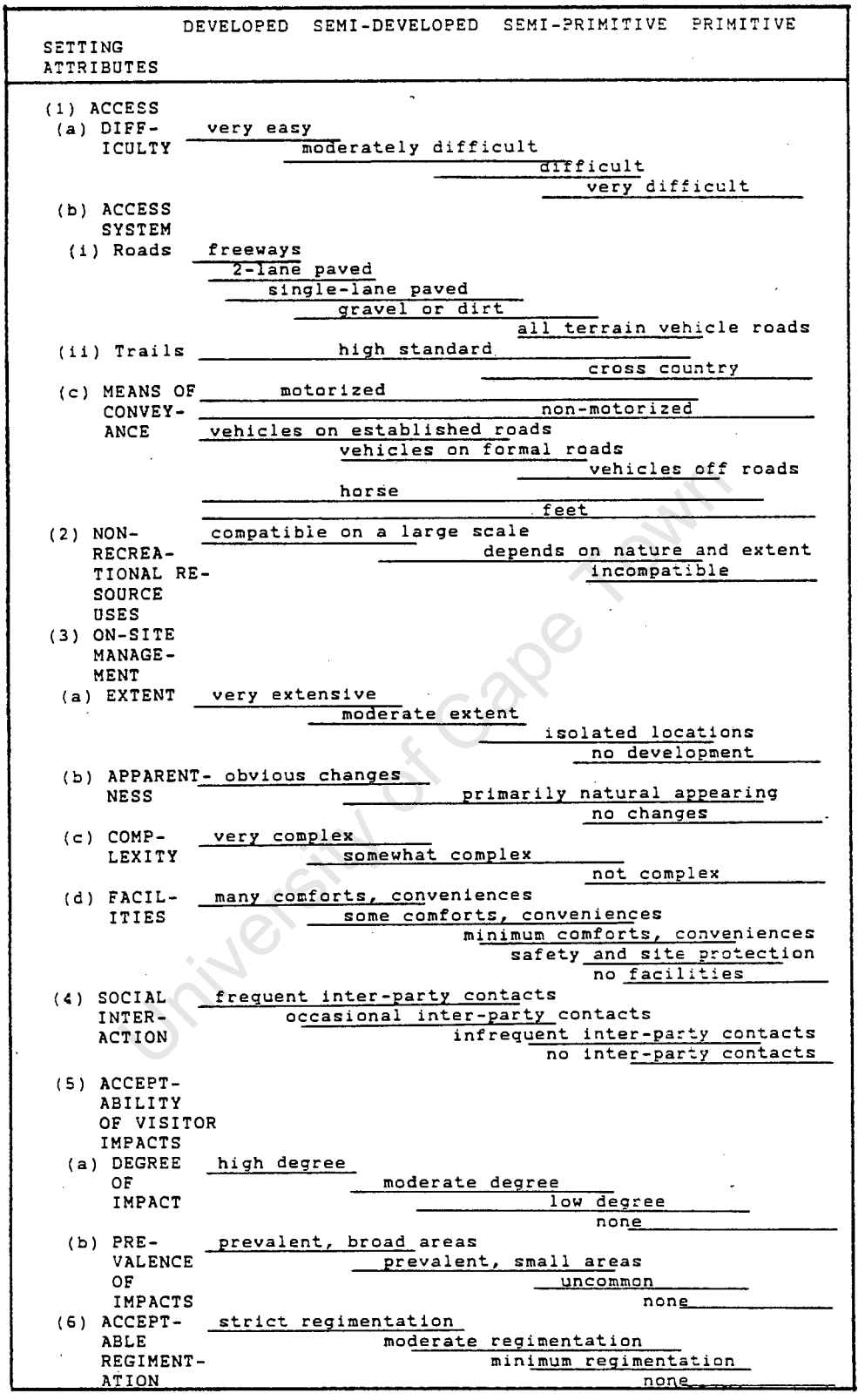


FIGURE 7: ATTRIBUTES DEFINING RECREATION SETTINGS
(Source: Clark & Stankey 1979[a]:15)

There is no distinct boundary between different settings (Clark & Stankey 1979[a]:14). The degree to which the attributes define a setting also varies according to the landscape type. Topography and vegetation may, for example, affect the perceived remoteness of an area (Brown, Driver & Berry 1980:17). There is however, no intrinsic quality of these natural features that suggests the appropriateness of a setting (Clark & Stankey 1979[a]:16).

The focus on setting attributes that can be influenced by management is a pragmatic one. The designation of a particular setting does not imply a single standard of development for all recreation sites within that category. Variations within and between settings further increase the range of options for pursuing different types of activities in a region and hence for deriving different experiences (Clark & Stankey 1979[a]:17). The attributes defining a setting are interdependent and unplanned changes may occur because of a change in one attribute (Clark & Stankey 1979[a]:26). Consistency should therefore be maintained between attributes describing a particular setting.

The range of conditions that an attribute can have represents relative rather than absolute limits of what is acceptable and appropriate along the ROS (Clark & Stankey 1979[a]:14). The standard of appropriateness thus varies along the spectrum. The challenge is to:

(1) Set standards for acceptable recreation conditions, taking into account other resource values and long term goals for the region.
(2) Provide adequate information so that visitors can make choices about where to go in keeping with their preferences and expectations.
(3) Manage and monitor conditions to ensure that the situation does not change inadvertently (Clark & Stankey 1979[a]:33-35).

To meet this challenge, a number of tasks have been outlined for implementing the ROS concept. The ROS implementation process has however, not been clearly articulated and varies according to different writers (see e.g. Brown, Driver, Bruns & McConnell 1979; Clark & Stankey 1979[a], [b]; Stankey & Brown 1981; Buist et al 1982; Stankey, Brown & Clark 1983; USDA, FS 1986). Moreover, this lack of clarity has been compounded by the recent introduction of the Limits of Acceptable Change (LAC) recreation planning system (see Section 5.5).

5.4 Implementation of the Recreation Opportunity Spectrum Concept

Task One: Analysis of Resource Capability and Existing Recreation Opportunities

The first task in implementing the ROS concept is to assess resource capability and determine the recreation opportunity potential of land and water resources. Initially the current availability of recreation opportunities is established and compared with potential resource capability. Planners can then determine whether available opportunities are consistent with resource potential, and identify any excesses or shortcomings. This analysis should encompass at least regional levels, transcend administrative boundaries, and include public and private suppliers of recreation opportunities. Therefore there is a need for inter-organisational co-ordination to carry out this task (Clark & Stankey 1979[a]:23).

This analysis is to be based on an assessment of the physical, social and managerial setting components of a region. The characteristics of each of these components affects the kind of experience the visitor is most likely to realise (USDA, FS 1986 Part IV:2). The planner does not attempt to catalogue experiences directly, but applies a number of indicator criteria to the setting where the

experience takes place. The indicator criteria function interdependently to categorise the effects of the setting characteristics upon experience opportunities. The manner in which the ROS concept categorises the effects of setting characteristics on the recreation experience markedly distinguishes the concept from other recreation resource inventories (Buist et al 1982:84). The criteria used by the USDA, Forest Service for this analysis are outlined in Table 4 (page 87-89).

Each setting component can be mapped separately and then overlayed to document the recreation opportunities of the planning area, and the conditions under management control which affect the recreation experience. The physical setting is defined by the presence or absence of human sights and sounds, size, and the amount of environmental modification caused by human activity. Remoteness from sights and sounds of man is used as an indicator of opportunities to experience greater or lesser amounts of social interaction, and primitive to urban influences. The size of an area indicates opportunities to experience degrees of self-sufficiency as related to a sense of vastness in relatively undeveloped areas. Evidence of humans reflects opportunities to recreate in settings having varying degrees of human influence or modification. This criterion is primarily based on the visual impact and effect of modifications on the recreation experience, as distinguished from only the physical existence of modifications. It also takes into account variations in the visual absorption capacity of different areas. The social setting reflects the amount and type of contact between visitors. Visitor density gauges opportunities for solitude, or interactions with a few selected individuals, or for meeting larger groups. The managerial setting, as indicated by the managerial regimentation and noticeability criterion, reflects the amounts and kinds of restrictions placed on visitors by an administering agency or private landowner (USDA, FS 1986 Part IV:4-17).

TABLE 4: ROS SETTING CRITERIA
(Source: USDA, FS 1986 Part IV:6-15)

REMOTENESS CRITERIA

PRIMITIVE	SEMI-PRIMITIVE NON-MOTORIZED	SEMI-PRIMITIVE MOTORIZED	ROADED NATURAL	RURAL	URBAN
An area designated at least 3 miles from all roads, railroads or trails with motorized use.	An area designated at least 0,5 mile but not further than 3 miles from all roads, railroads or trails with motorized use; can include the existence of primitive roads and trails in usually closed to motorized use.	An area designated within 0,5 mile of primitive roads or trails used by motor vehicles; but not closer than 0,5 mile from better than primitive roads.	An area designated within 0,5 mile from better than primitive roads and railroads.	No distance criteria.	No distance criteria.

SIZE CRITERIA

PRIMITIVE	SEMI-PRIMITIVE NON-MOTORIZED	SEMI-PRIMITIVE MOTORIZED	ROADED NATURAL	RURAL	URBAN
5000 acres.	2500 acres.	2500 acres.	No criteria.	No criteria.	No size criteria.

EVIDENCE OF HUMANS CRITERIA

PRIMITIVE	SEMI-PRIMITIVE NON-MOTORIZED	SEMI-PRIMITIVE MOTORIZED	ROADED NATURAL	RURAL	URBAN
Setting is essentially an unmodified natural environment. Evidence of humans would be unnoticed by an observer wandering through the area.	Natural setting may have subtle modifications that would be noticed but not draw the attention of an observer wandering through the area.	Natural settings may have moderately dominant alterations but would not draw the attention of motorized observers on trails and primitive roads within the area.	Natural setting may have modifications which range from being easily noticed to strongly dominant to observers within the area. However from sensitive travel routes and use areas these alterations would remain unnoticed or visually subordinate.	Natural setting is culturally modified to the point that it is dominant to the sensitive travel route observer. May include pastoral, agricultural, intensively managed wildland resource landscapes, or utility corridors. Pedestrian or other slow moving observers are constantly within view of culturally changed landscape.	Setting is strongly structure dominated. Natural or natural-appearing elements may play an important role but be visually subordinate. Pedestrian and other slow moving observers are constantly within view of artificial enclosure of spaces.
Evidence of trails is acceptable, but should not exceed standard to carry expected use.	Little or no evidence of primitive roads and the motorized use of trails and primitive roads.	Strong evidence of primitive roads and the motorized use of trails and primitive roads.	There is strong evidence of designed roads and/or highways.	There is strong evidence of designed roads and/or highways.	There is strong evidence of designed roads and/or highways and streets.
Structures are extremely rare.	Structures are rare and isolated.	Structures are rare and isolated.	Structures are generally scattered, remaining visually subordinate to unnoticed to the sensitive travel route observer. Structures may include power lines, microwave installations, and so on.	Structures are readily apparent and may range from scattered to small dominant clusters including power lines, microwave installations, local ski areas, minor resorts and recreation sites.	Structures and structure complexes are dominant, and may include major resorts and marinas, national and regional ski areas, towns, industrial sites, condominiums or second home developments.

SOCIAL SETTING CRITERIA

PRIMITIVE	SEMI-PRIMITIVE NON-MOTORIZED	SEMI-PRIMITIVE MOTORIZED	ROADED NATURAL	RURAL	URBAN
Usually less than 6 parties per day encountered on trails and less than 3 parties visible at campsites.	Usually 6-15 parties per day encountered on trails and 6 or less visible at campsites.	Low to moderate contact frequency.	Frequency of contact is moderate to high on roads; low to moderate on trails and away from roads.	Frequency of contact is moderate to high in developed sites, on roads and trails and water surfaces. Moderate away from developed sites.	Large numbers of users on-site and in nearby areas.

MANAGERIAL SETTING CRITERIA

PRIMITIVE	SEMI-PRIMITIVE NON-MOTORIZED	SEMI-PRIMITIVE MOTORIZED	ROADED NATURAL	RURAL	URBAN
On-site regimentation is low with controls primarily off-site.	On-site regimentation and controls present.	On-site regimentation and controls present.	On-site regimentation and controls are noticeable, but harmonize with the natural environment.	Regimentation and controls obvious and numerous, largely in harmony with the man-made environment.	Regimentation and controls obvious and numerous.

According to Stankey & Brown (1981:68) indicators of the physical setting component distinguish the potential resource capability of an area. By compiling a resource capability map it will be possible to distinguish the boundaries of potential recreation opportunities in a region. In addition, special landscape features required for recreation activities should be identified and outlined on a map of activity opportunities. Attractiveness, in relation to ROS classes, can also be mapped (Stankey & Brown 1981:68; USDA, FS 1986 Part IV:17-20). The combination of the recreation opportunity capability map, and activity opportunity map provides the basic reference document for the rest of the recreation planning process (Stankey & Brown 1981:68).

Indicators of the social and managerial setting components are the key to the inventory of existing recreation opportunities. In contrast to the indicators used by the USDA, Forest Service (1986) (see Table 4), Stankey & Brown (1981:69) suggest that standards indicating acceptable conditions for the attributes outlined in Figure 7 be used in the assessment of existing opportunities. These attributes provide a somewhat more comprehensive inventory of existing social and managerial settings than those used by the USDA, Forest Service.

A comparison of the map of recreation opportunity capability and current opportunity availability will determine whether present management is providing opportunities consistent with potential resource capability. This task also facilitates the identification of administrative responsibility and the formulation of suitable roles for the various suppliers of recreation opportunities (Clark & Stankey 1979[a]:23-24).

Task Two: Determining the Appropriate Allocation of Opportunities

A comparison of the analysis undertaken in task one, with

available knowledge on recreation demand will indicate shortfalls or excesses in the provision of recreation opportunities. Estimating the demand for specific recreation opportunities is however, currently a major deficiency in implementing the ROS concept. Assessment of recreation demand is still in developmental stages (Stankey & Brown 1981:67). Planners are trying various ad hoc methods of summarising demand information into ROS classes to provide approximate answers for the time being. Continued methodological development is urgently needed to refine the analysis of recreation demand in the context of the ROS concept (Buist et al 1982:85). Some development in this regard is proposed in Section 6.3 on the basis of a study of attitudes regarding the appropriate setting, activities and important experiences in a visit to the Cederberg.

According to Clark & Stankey (1979[a]:24-26), implementation of the ROS concept is not reliant on prior knowledge of recreation demand. The lack of knowledge about existing opportunities may be virtually as great a deterrent to participation as is the actual unavailability of opportunities. Therefore, merely upgrading the flow of information to people about the nature and location of existing opportunity settings increases the benefits derived from recreation.

The way in which planners and decision-makers are to weigh up alternative allocations of recreation opportunities is not very clearly stated in the literature. Determining carrying capacity measures for each recreation opportunity (see Section 4.4) is considered to provide an indication of the appropriate level of use for a given recreation opportunity. Such measures are said to serve as a standard against which existing and potential conditions can be judged acceptable or otherwise. They may also facilitate quantification of the effects of alternative allocations and provide a basis for estimating trade-offs between recreation and non-recreation

resource allocation (Stankey & Brown 1981:69-70; USDA, FS 1986 Part IV:21-26). Recent work on the concept of recreation carrying capacity appears to have considerably improved such measures. It may not be possible to implement the ideal spatial arrangement because of previous decisions, non-recreation resource use, established recreation use and other considerations. But existing and potential inconsistencies and conflicts can nonetheless be identified and mitigated as much as possible by appropriate management action (Clark & Stankey 1979[a]:23).

Task Three: Identifying Appropriate Management Actions

The ROS concept facilitates assessment of how management actions will affect the nature of recreation opportunities, and an evaluation of whether or not they are appropriate (Clark & Stankey 1979[a]:24). The criteria used to define and delineate each planned recreation opportunity prescribe the appropriateness of management actions. The manager is therefore limited to those things consistent with the objectives established through the planning process (Stankey & Brown 1981:71-72). Undesirable problems arising from management actions can thus be anticipated and avoided. The key to the effective implementation of the ROS concept is a clearly defined area management plan. Only with explicit management objectives is it possible to judge whether the consequences of an action are appropriate or not (Clark & Stankey 1979[a]:24).

Task Four: Monitoring and Evaluating the Attainment of Management Objectives

Monitoring is conducted to provide managers with information on trends and changes in recreation conditions. According to Stankey, Brown & Clark (1983:228-229) monitoring can provide managers with feedback on recreation opportunities; identify changes in conditions (as a result of both recreation and

non-recreation impacts); and provide feedback on management effectiveness and on the effect of allocation decisions. The monitored conditions can then be compared with the standards which define the appropriateness of physical, biological, social and managerial setting conditions. This comparison provides the basis for a systematic evaluation of recreation conditions and for recommending any changes to management objectives. When a setting attribute is inconsistent with specified standards, several management options could be undertaken:

(1) No management action could be undertaken (but in light of the aim of the ROS concept this would be undesirable).
(2) Management could identify and alter the attribute causing the inconsistency.
(3) Management could alter the remaining attributes to bring them in line with the inconsistent attribute, thereby changing the setting. The desirability of this option would have to be assessed against the availability of and demand for other recreation settings (Clark & Stankey 1979[a]:21).

The basic concern regarding inconsistencies relates to the potential for triggering a chain of events that may alter the entire nature of the intended recreation opportunity. An important responsibility facing recreation planners and managers is therefore to identify the location, type and level of change considered appropriate and acceptable in the area, and the actions consistent with protecting the area from changes in excess of those judged acceptable (Stankey & McCool 1984:466). This concern has usually been addressed from the perspective of carrying capacity. As indicated in Section 4.4 the traditional carrying capacity model has been difficult to implement and needs to be viewed in the context of a balance of recreation opportunities. The traditional carrying capacity model has recently been reformulated and is

now being superceded by the "Limits of Acceptable Change" (LAC) system (Stankey & McCool 1984:466; Lucas & Stankey 1985:1-2; Stankey, Cole, Lucas, Petersen & Frissell 1985:2).

5.5 Defining Limits of Acceptable Change

The purpose of the LAC system is to define acceptable limits to the changes resulting from recreational use, and to provide a basis for managing recreation opportunities within those limits (Lucas et al 1985:1-2; Stankey, Cole, Lucas, Petersen & Frissell 1985:1). The rationale underlying LAC dates back to the early 1970's (see e.g. Frissell & Stankey 1972). The LAC system does not render obsolete what has been learned about carrying capacity in the past. It focusses on the conditions desired in a recreation setting rather than on use levels per se. It draws attention to the prescriptive nature of judgments of acceptable change, rather than the technical procedure of understanding the relationships between use and change (Lucas et al 1985:2-3).

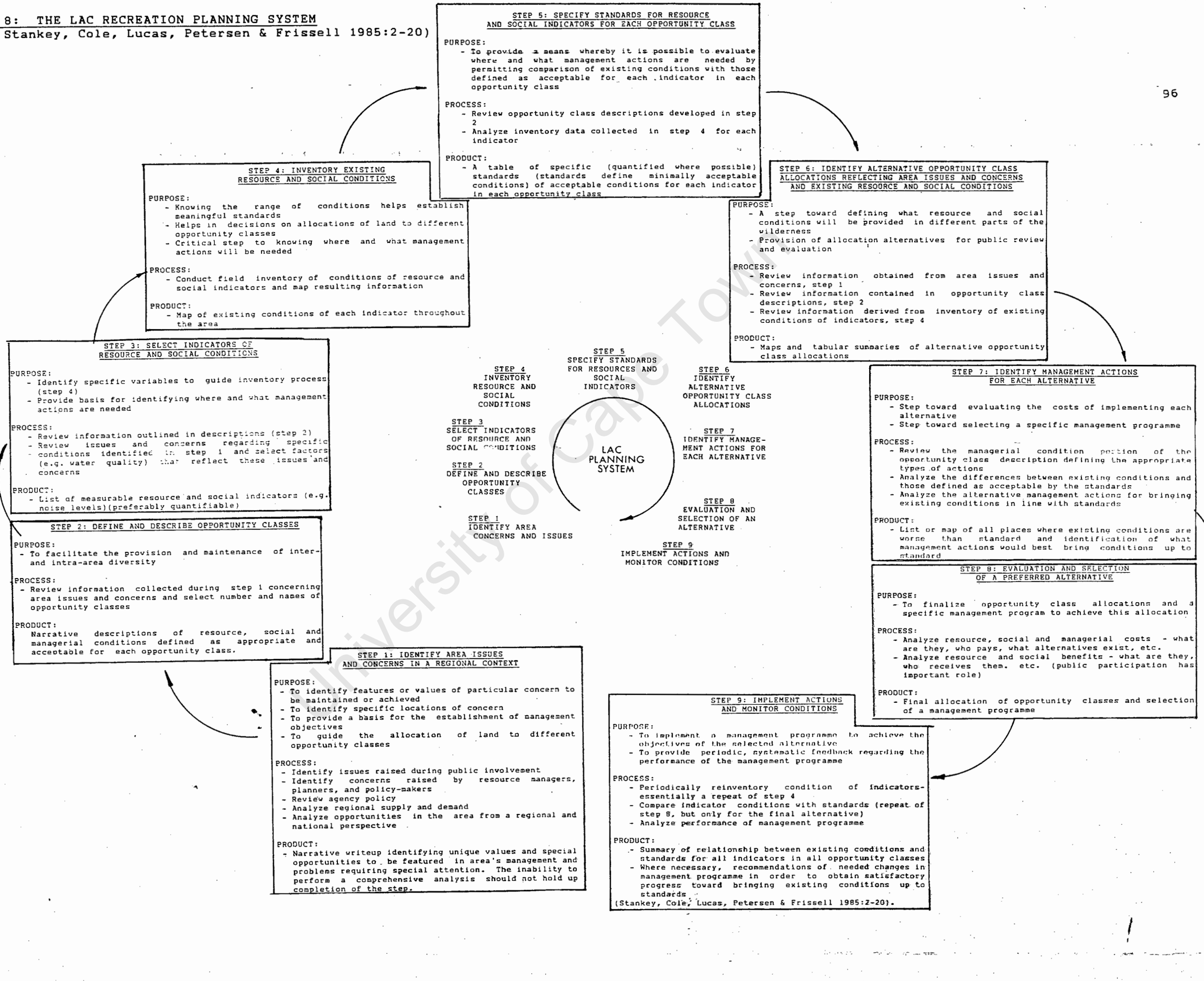
The LAC system and ROS concept are interrelated. The precise relationship between the two does not however, appear to have been explicitly stated. It can nonetheless, be inferred that the LAC system is aimed at more detailed, area-specific planning and is therefore a supplement to the ROS concept. (This inference was confirmed by Haas, pers. comm.; McCool, pers. comm..) The LAC system consists of a series of interrelated steps leading to the development of a set of measurable objectives that define desired recreation conditions. It also identifies the management actions necessary to maintain those conditions (Stankey, Cole, Lucas, Petersen & Frissell 1985:3). The LAC system consists of four major components:

(1) The specification of acceptable and achievable resource and social conditions, defined by a set of measurable parameters.

(2) An analysis of the relationship between existing conditions and those judged acceptable.
(3) The identification of management actions necessary to achieve those conditions.
(4) A program of monitoring and evaluation of management effectiveness (Stankey, Cole, Lucas, Petersen & Frissell 1985:3).

These components are outlined in more detail in Figure 8 (page 96). The steps outlined in Figure 8 will not guarantee that the resultant recreation plan will meet the needs of society. The success of translating recreation plans into desired opportunities depends far less on the plan itself than on the people who make it, those who will decide whether to carry it out, and those who will then actually put it into operation. "Plans don't work; people do!" (Rettie 1970:306). In the past many recreation planning efforts relied heavily on a technocratic planning approach and included the public in only a peripheral manner. Reliance on numerical calculations and models have left communities, agencies and corporations with plans that are unresponsive to public needs and concerns. In a rapidly changing society, values are often in flux and goals and objectives cannot easily be defined or determined. In general, not enough consideration has been given to the political environment in which planning occurs. As a result, adversarial relationships have often developed between the recreation management agency and the public (Ashor, McCool & Stokes 1986:424). It is important to realise that because resource planning is ultimately a political rather than a technical process, manager's technical skills are needed but must be combined with political competence to ensure understanding of different interest groups and their needs (Stankey, McCool & Stokes 1986:530).

FIGURE 8: THE LAC RECREATION PLANNING SYSTEM
(After Stankey, Cole, Lucas, Petersen & Frissell 1985:2-20)



STEP 1: IDENTIFY AREA ISSUES AND CONCERNS IN A REGIONAL CONTEXT

PURPOSE:
- To identify features or values of particular concern to be maintained or achieved
- To identify specific locations of concern
- To provide a basis for the establishment of management objectives
- To guide the allocation of land to different opportunity classes

PROCESS:
- Identify issues raised during public involvement
- Identify concerns raised by resource managers, planners, and policy-makers
- Review agency policy
- Analyze regional supply and demand
- Analyze opportunities in the area from a regional and national perspective

PRODUCT:
- Narrative writeup identifying unique values and special opportunities to be featured in area's management and problems requiring special attention. The inability to perform a comprehensive analysis should not hold up completion of the step.

STEP 2: DEFINE AND DESCRIBE OPPORTUNITY CLASSES

PURPOSE:
- To facilitate the provision and maintenance of inter- and intra-area diversity

PROCESS:
- Review information collected during step 1 concerning area issues and concerns and select number and names of opportunity classes

PRODUCT:
Narrative descriptions of resource, social and managerial conditions defined as appropriate and acceptable for each opportunity class.

STEP 3: SELECT INDICATORS OF RESOURCE AND SOCIAL CONDITIONS

PURPOSE:
- Identify specific variables to guide inventory process (step 4)
- Provide basis for identifying where and what management actions are needed

PROCESS:
- Review information outlined in descriptions (step 2)
- Review issues and concerns regarding specific conditions identified in step 1 and select factors (e.g. water quality) that reflect these issues and concerns

PRODUCT:
- List of measurable resource and social indicators (e.g. noise levels)(preferably quantifiable)

STEP 4: INVENTORY EXISTING RESOURCE AND SOCIAL CONDITIONS

PURPOSE:
- Knowing the range of conditions helps establish meaningful standards
- Helps in decisions on allocations of land to different opportunity classes
- Critical step to knowing where and what management actions will be needed

PROCESS:
- Conduct field inventory of conditions of resource and social indicators and map resulting information

PRODUCT:
- Map of existing conditions of each indicator throughout the area

STEP 5: SPECIFY STANDARDS FOR RESOURCE AND SOCIAL INDICATORS FOR EACH OPPORTUNITY CLASS

PURPOSE:
- To provide a means whereby it is possible to evaluate where and what management actions are needed by permitting comparison of existing conditions with those defined as acceptable for each indicator in each opportunity class

PROCESS:
- Review opportunity class descriptions developed in step 2
- Analyze inventory data collected in step 4 for each indicator

PRODUCT:
- A table of specific (quantified where possible) standards (standards define minimally acceptable conditions) of acceptable conditions for each indicator in each opportunity class

STEP 6: IDENTIFY ALTERNATIVE OPPORTUNITY CLASS ALLOCATIONS REFLECTING AREA ISSUES AND CONCERNS AND EXISTING RESOURCE AND SOCIAL CONDITIONS

PURPOSE:
- A step toward defining what resource and social conditions will be provided in different parts of the wilderness
- Provision of allocation alternatives for public review and evaluation

PROCESS:
- Review information obtained from area issues and concerns, step 1
- Review information contained in opportunity class descriptions, step 2
- Review information derived from inventory of existing conditions of indicators, step 4

PRODUCT:
- Maps and tabular summaries of alternative opportunity class allocations

STEP 7: IDENTIFY MANAGEMENT ACTIONS FOR EACH ALTERNATIVE

PURPOSE:
- Step toward evaluating the costs of implementing each alternative
- Step toward selecting a specific management programme

PROCESS:
- Review the managerial condition portion of the opportunity class description defining the appropriate types of actions
- Analyze the differences between existing conditions and those defined as acceptable by the standards
- Analyze the alternative management actions for bringing existing conditions in line with standards

PRODUCT:
- List or map of all places where existing conditions are worse than standard and identification of what management actions would best bring conditions up to standard

STEP 8: EVALUATION AND SELECTION OF A PREFERRED ALTERNATIVE

PURPOSE:
- To finalize opportunity class allocations and a specific management program to achieve this allocation

PROCESS:
- Analyze resource, social and managerial costs - what are they, who pays, what alternatives exist, etc.
- Analyze resource and social benefits - what are they, who receives them, etc. (public participation has important role)

PRODUCT:
- Final allocation of opportunity classes and selection of a management programme

STEP 9: IMPLEMENT ACTIONS AND MONITOR CONDITIONS

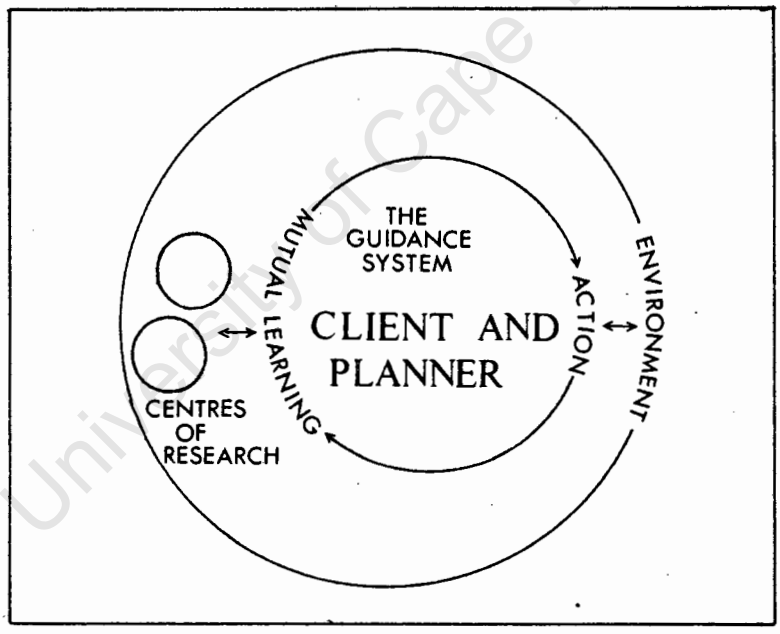
PURPOSE:
- To implement a management programme to achieve the objectives of the selected alternative
- To provide periodic, systematic feedback regarding the performance of the management programme

PROCESS:
- Periodically reinventory condition of indicators- essentially a repeat of step 4
- Compare indicator conditions with standards (repeat of step 8, but only for the final alternative)
- Analyze performance of management programme

PRODUCT:
- Summary of relationship between existing conditions and standards for all indicators in all opportunity classes
- Where necessary, recommendations of needed changes in management programme in order to obtain satisfactory progress toward bringing existing conditions up to standards

(Stankey, Cole, Lucas, Petersen & Frissell 1985:2-20).

The comprehensive planning ideal is largely unattainable because of the tendency towards elitism, centralisation and resistance to change (Grabow & Heskin 1973 in Ashor et al 1986:424). An alternative approach, called transactive planning, has been proposed by Friedmann (1977). This approach has recently been successfully applied in the context of recreation planning and specifically for the purpose of defining LAC (Stankey, McCool & Stokes 1986; Ashor et al 1986; McCool, pers. comm.). The transactive planning approach is decentralised and emphasises grassroots involvement by people who may be affected by planning decisions. A model for transactive planning is outlined in Figure 9.



PLANNERS CONTRIBUTE
- concepts
- theory
- analysis
- processed knowledge
- new perspectives
- systematic search procedures

CLIENTS CONTRIBUTE
- intimate knowledge of context
- realistic alternatives
- norms
- priorities
- feasibility judgments
- operational details

FIGURE 9: A MODEL OF TRANSACTIVE PLANNING
(Source: Friedmann in Gilbert & Specht 1977:116).

Transactive planning is viewed as a thinking, learning and continually evolving process. Dialogue, mutual learning and societal action and guidance are key elements of the transactive planning approach (Ashor et al 1986:424-425). The transactive process is considered to be effective in recreation planning for:

(1) Providing a vehicle for a dynamic, ongoing planning process rather than a static management plan.
(2) Showing the management and political problems of agencies to citizen participants.
(3) Improving co-ordination between agencies.
(4) Involving a representative range of public and user groups as active participants.
(5) Breaking new ground in recreation planning (Ashor et al 1986:427-428).

The transactive planning process thus provides a practical mechanism for implementing the ROS concept and for ultimately defining the LAC for an area.

5.6 Advantages of the Recreation Opportunity Spectrum Concept

5.6.1 A Way to Think about Recreation Planning and Management

> Possibly one of the most important roles of the ROS is in providing managers and planners a framework within which they can consider the role of recreation within a complex human and resource system. It can facilitate purposeful thinking about the kinds of recreation provided, the location and relationship of these opportunities, and the kinds of complementarities and conflicts that exist among different opportunities as well as with different resource uses. The ROS also helps focus attention on the fact that recreation is concerned primarily with producing experiences for people (USDA, FS 1986 Part V:32).

By taking into account direct and indirect pressures on

recreation opportunities, the ROS concept provides a basis for addressing the problems arising from the insidious modification of recreation opportunities. The ROS concept thus supplements the principle of maintaining an integrated environmental continuum (see Section 3.8). In addition, because the ROS is not a quality continuum, it can help to avoid the polarisation of attitudes regarding the appropriate use of an area, such as developed in the "Cederberg Controversy".

The ROS concept is applicable at all levels of land-use planning and management (Clark 1982:10). The focus on the regional scale, however, has particular merit compared to either the single-site approach or national perspective outlined in Sections 4.3 and 4.4. An important reason for adopting a regional approach is that each resource must be evaluated in terms of interdependent relationships, with other resources. Such studies cannot possibly be carried out on a national scale. It therefore becomes necessary to delimit study areas to manageable proportions (Page & Rabie 1983:456-457). Moreover, the concept of a region seems intrinsic to the thought patterns of contemporary humans, especially in western, industrialised countries (Young, Steiner, Brooks & Struckmeyer 1983:270).

5.6.2 Guiding and Evaluating Management Options and Actions

The ROS concept makes explicit why and how recreation resource inventories are to be prepared. By using explicit criteria and standards of biophysical, social and managerial setting conditions, the assumptions, objectives and consequences of management actions on recreation opportunities can be established and judged appropriate or otherwise. The subjective nature of such judgments is clearly recognised. Once a decision has been made about the ROS class the area is to be managed for, it will become readily apparent whether conditions are consistent with the

management objectives for the area. This will facilitate the identification of potentially incompatible uses (i.e. both recreation and non-recreation uses). Conflicts can then be avoided or at least minimised (Driver & Brown 1978:29; Stankey & Brown 1981:72; Clark 1982:10; USDA, FS 1986 Part V:32-36).

The ROS concept also helps to identify specific management actions that might be needed to achieve certain conditions in the future (USDA, FS 1986 Part V:32). The concept also provides an explicit basis for monitoring the attainment of objectives. The ROS concept thus helps to integrate and coordinate recreation and non-recreation activities, and management actions, both spatially and temporally (Clark 1982:10-11). The ROS concept enables change to be accommodated and highlights the consequences of alternative solutions to these changes (Stankey & Brown 1981:72). The ROS concept can be used, on a regional level, to assess if visitor demands are being met by the various suppliers of recreation opportunities and to assess which agency or private supplier is best suited to meeting demands for currently unavailable opportunities (USDA, FS 1986 Part V:35). The ROS concept also provides a framework for more localised recreation planning and management (see e.g. Chilman 1983).

5.6.3 Linking Visitor Preferences and Needs with Recreation Opportunities

> Increasingly we have come to realise that the real measures of recreation management effectiveness are the experiences that people realize. In the ROS system, these outcomes are clearly seen as critical and although it is not possible to state categorically that certain outcomes are predictably the result of certain activities undertaken in certain settings, it is likely that many experiences are the probable consequence of participation in certain settings (USDA, FS Part V:34).

Recreation planners and managers are faced with limited information concerning the experiences visitors seek. Moreover, it is difficult to obtain this information because the relationships between experiences sought, activities and recreation settings are complex. By increasing the flow of information about existing opportunities visitors will be able to choose appropriate settings for their preferred activities and hence obtain desired experiences and benefits (Clark & Stankey 1979[a]:24-25). The ROS concept readily facilitates interaction with the public, and provides an indication of how both recreation and non-recreation resource use decisions will affect recreation opportunities (Driver & Brown 1978:29; USDA, FS 1986 Part V:36). Increasing the flow of information on and enhancing interaction between users and suppliers of opportunities will thus help to avoid recreation conflict (Stankey & Brown 1981:72).

5.7 Research Needs

Although the ROS concept is founded on the results of recent recreation research and management experience, it is nonetheless based on "state-of-the-art judgments" (Clark & Stankey 1979[a]:27; Clark 1982:10). While the basic concept is simple, the implied interactions are complex and not yet clearly defined. The ROS concept is process-oriented rather than mechanistic and prescriptive. Criteria and standards should be viewed as guideposts rather than as absolute specifications. The formulation of appropriate standards should combine information from research, public input, administrative policies, legislative guidelines and manager's judgement. The ROS concept will not dictate decisions, nor provide answers, but will allow planners and managers to test assumptions and objectives (Clark 1982:10).

The ROS concept needs to be refined in the light of management experience and as new information becomes available from research. The relationships between settings,

activities and experiences needs further investigation so that management can better help visitors achieve desired experiences, and so that the boundaries between different recreation opportunities can be more precisely defined (Brown, Driver & McConnell 1978:83; Clark & Stankey 1979[a]:27). Particular attention needs to be given to developing methods for analysing recreation demand in the context of the ROS concept. Consideration also needs to be given to how preferences for recreation settings and activities are influenced by available opportunities; to what extent the experiences visitors seek are substitutable; and to how preferences for recreation evolve over time (Clark & Stankey 1979[a]:27). Ongoing attention will need to be given to identifying, and measuring criteria and standards (Brown, Driver & McConnell 1978:79, 84). The analysis of the appropriate roles of the various suppliers of recreation opportunities will also need ongoing attention (Clark & Stankey 1979[a]:27).

5.8 Conclusion

By focussing on the regional scale and by taking into account the direct and indirect pressures on recreation opportunities, the ROS concept has considerable advantages over traditional recreation planning approaches. In addition, the underlying rationale of the ROS concept complements the principle of maintaining an integrated environmental continuum.

The recent "Cederberg Controversy" demonstrates the urgent need for a comprehensive, yet practical framework for planning recreation in South Africa. It is therefore recommended that the ROS concept, supplemented by the more area-specific LAC system, should be applied to recreation planning in South Africa.

CHAPTER SIX: VISITOR ATTITUDES ABOUT APPROPRIATE FUTURE RECREATION USE OF THE CEDERBERG

6.1 Introduction

The ROS concept exhibits considerable potential for addressing the issue of appropriate recreation use in South Africa. Before the ROS concept can be effectively implemented locally, attention will have to be given to adapting the concept to South African conditions. As a first step towards the application of principles of the ROS concept in South Africa, and to aid planners in finding a solution to the "Cederberg Controversy", a study of visitor attitudes about appropriate future recreation use of the Cederberg was conducted.

6.2 Study Approach

The fundamental question the study addresses is: "What recreation opportunities are perceived to be appropriate for the currently undeveloped area of the Cederberg?"

Attention is focussed on visitor attitudes about three key elements of the ROS concept, namely the appropriateness of recreation settings and activities for the area and the importance of various experiences. The objective of the study is to provide planners with empirical data of visitor attitudes in this regard. The study serves as a preliminary investigation into the viability of using the ROS concept for planning recreation in South Africa.

A mail survey was judged to be the most effective means of achieving the study objective (Babbie 1973:31-38, 57-59; Bentham & Moseley 1982:348-349) (see Appendix A). The survey was restricted to Cederberg visitors because they represent a range of "recreation experts" who were likely to be most

competent in answering questions regarding the future recreation use of the area (Babbie 1973:142-143). The survey excluded day visitors to the Cederberg. Their limited stay in the area and geographical dispersion would make an on-site survey impractical, and comprehensive records of names and addresses were not available to do a mail survey. Thus, only overnight visitors to the Cederberg were surveyed. Respondents were selected from a population that had made overnight visits to the Cederberg between 1 November 1984 and 31 October 1985. This was done by taking a systematic random sample from the visitor records at Algeria forest station and the farms Dwarsrivier (including Sanddrif) and Kromrivier (see Figure 1). (Note: Only "group leaders", or the person in whose name the visit was booked, were surveyed. Group leaders and other party members may have different attitudes [Jubenville 1971:116-119].)

It was recognised that visitors to the Cederberg represent only a small proportion of the "recreating public" (Taylor 1984:38-41). Currently the Cederberg offers a range of nature-oriented recreation opportunities. Visitors to the area are thus likely to favour recreation opportunities at the less developed end of the spectrum. Others may prefer more developed recreation opportunities. Although information from other interest groups will be needed to adequately plan the future use of the Cederberg visitor attitudes are particularly pertinent in addressing the fundamental question of this study. Extensive land-use practices in the Cederberg, such as the water catchment function and nature conservation, make an important contribution to social well-being (see Section 2.3.2). Any future change to recreation opportunities in the area will need to be compatible with these activities. The issue to be resolved is therefore: "How extensive should recreation opportunities be in the Cederberg?"

A dominant theme in recreation research has been that people have a diversity of preferences and motivations for

participating in recreation activities (see Section 4.2). It was therefore expected that visitor attitudes about appropriate recreation opportunities for the Cederberg would vary. It has however, also been shown that consensus can often be found between visitor groups (see e.g. Manning 1985[a]; Vaske et al 1986 on crowding and encounter norms). Visitors were therefore divided into the following readily identifiable groups: hikers, i.e. visitors who stay overnight in the wilderness area, campers, i.e. visitors who stay overnight at the designated campsites at Algeria and Dwarsrivier, and bungalow visitors, i.e. visitors who stay overnight in the cottages at Dwarsrivier and Kromrivier.

The basic hypothesis of this study was that hikers, campers and bungalow visitors would have different attitudes about the appropriate recreation opportunity for the currently undeveloped area of the Cederberg. It was expected that these groups would have divergent attitudes about the appropriate setting for the area, appropriate activities for the area, and important experiences in a visit to the Cederberg. A knowledge of the attitudes of different visitor groups gives managers more specific information about the way in which a site may be used, and is useful in assessing the implications of alternative management strategies (Collins & Hodge 1984: 158).

6.3 Questionnaire Design

There is no universally accepted single approach to designing a survey questionnaire. Survey design combines elements of both art and science (Dunne, pers. comm.). Particular attention has to be given to the information sought; type of question and method of administration; question content; form of response; question wording; question sequence; physical characteristics of the questionnaire; and the examination, re-examination and revision of questions (in the light of pre-tests and a pilot survey) (see e.g. Oppenheim 1966; Isaac

1971; Churchill 1983). This discussion concentrates on the type of information sought and the administration of key questions. For further details regarding the design and construction of the questionnaire see Appendix B.

6.3.1 The Appropriate Recreation Setting for the Cederberg: An Application of Conjoint Analysis

A recreation setting (e.g. "primitive" or "developed") is a multi-attribute concept that includes attributes of a biophysical, social and managerial nature (see Section 5.3.3) (Clark & Stankey 1979[a]:1). The value of a particular setting to a visitor will be determined by perceptions of the opportunity to undertake preferred activities and to obtain desired experiences. The recreation setting is the component of the recreation opportunity that can best be manipulated by management to influence visitor experience. Knowing the importance visitors attach to particular attributes of the recreation setting is therefore the foundation of effective recreation management (Clark & Stankey 1986:509).

Two issues were judged to be important in a study of attitudes about the appropriate recreation setting for an area. Firstly, the perceived appropriateness of alternative recreation settings should be studied. Secondly, attention should be given to the relative importance of attributes describing any particular recreation setting. A suitable method for analysing these issues has apparently not been applied by recreation planners, and is perhaps a hindrance to the effective implementation of the ROS concept. Particular attention was therefore given to the analysis of these issues in this study. The technique of conjoint analysis was judged to be particularly well suited for this task, because it enables both the absolute (comparison of settings) and relative (comparison of attribute levels) importance of multi-attribute alternatives to be assessed. Current work in multiple-criteria decision-making, within the discipline of

operations research, can also inform such complex planning tasks (Dunne, pers. comm.). This work does not however, appear to have been applied in a recreation planning context.

6.3.1.1 Conjoint Analysis

The seminal work on conjoint analysis was done by Luce & Tukey (1964). Over the past two decades, the technique has been further developed and refined, and is gaining wide support among academic and industrial researchers (see e.g. Green & Wind 1975; Green & Srinivasan 1978; Peckelman & Sen 1979; Blake 1982). The aim of conjoint analysis is to study how people make choices among multi-attribute alternatives. The word "conjoint" is derived from the evaluation of relative values of attributes considered jointly, which might not be individually measurable (Johnson 1974:121). The technique is based on the assessment of a respondent's ranking of a prespecified combination of different levels of the attributes (e.g. setting attributes), or profiles (see page 113), that describe a set of objects (e.g. recreation settings) (Green & Srinivasan 1978:104). Conjoint analysis facilitates the measurement and prediction of the part-worths (or utility) of the attributes (i.e. the independent variables) which partially define a respondent's preference for a particular object (e.g."semi-primitive" setting) (Blake 1982:2). In addition, the overall utility of different objects (e.g. recreation settings) can be determined.

The greatest strength of conjoint analysis is its ability to generate quite refined predictions from rather primitive data (Johnson 1974:126). The technique requires only rank order input but yields interval scaled output, with scales having common units for all independent variables, indicating the relative importance of each level of attribute in terms of part-worths (see Haynes, Harvey & Davies [1982:1-2] for a discussion on measurement scales). The technique enables one to make predictions about preferences for specified choices

and for choices implied by research design. The research design facilitates calculations of the part-worths of each attribute level, given the actual ranking of only a small fraction of all possible alternatives. Therefore it is not necessary to present the full range of profiles to the respondent. By comparison, traditional testing procedures may require numerous tests to explore all these possibilities (Johnson 1974:127). Consequently conjoint analysis is a useful and powerful technique for analysing preferences or perceptions when the range of possible choices is larger than one could realistically ask respondents to evaluate (Cosper & Kinsley 1984:232).

This strength however, comes at a cost. The part-worth or utility function model assumes that attribute levels have no synergistic effects on respondent's utility and that the whole is the simple sum of the parts, i.e. that there is no interaction or correlation between attributes (Johnson 1974:126). To the extent that this does not hold, the results can be misleading. With substantial interaction between attributes, the prespecified combination of attribute levels can produce unrealistic profiles that respondents cannot meaningfully rank (Blake 1982:38). To guard against this, it is advisable to increase the number of profiles relative to the number of attribute levels. As a "rough rule of thumb", Cosper et al (1984:230) suggest that the minimum number of profiles to be ranked should be determined by the product of the number of levels of the attribute with the most levels and the number of levels of the attribute with the second highest number of levels. Careful consideration should, however, also be given to minimising the total number of profiles presented. Overloading respondents will also increase the possibility of arbitrary and therefore meaningless trade-offs (Blake 1982:18). These considerations were given particular attention in the design and construction of the questionnaire (see Appendix B.2).

The method of data analysis is mathematically similar to the analysis of variance. The criterion variable however, consists of the ordinal preference rankings of the stimuli while the predictor variables are the factorial levels making up each stimulus (Green & Tull 1978 in Cosper et al 1984:226). There are several possible parameter estimation models for conjoint analysis (see Green & Srinivasan 1978:112-114; and Blake 1982:134-141 for a detailed comparison of different models). For this study the MONANOVA (an acronym for monotonic analysis of variance) programme was used (see e.g. Kruskal & Carmone 1968; Cosper 1982; Shall 1984). This model assumes that the dependent variable is at most ordinally scaled. MONANOVA and the other models differ by only very small amounts in their predictive validity (Green & Srinivasan 1978:112-114). The MONANOVA programme is considered to be reliable and can facilitate the accurate recovery of each respondent's (and the average respondent's) part-worths for the various attribute levels describing a multi-attribute object (Blake 1982:134-141). In essence, the programme looks for the ascending monotonic transformation of the data matrix in which the variance explained by the main effects is maximised and the effects of interactions minimised. It is assumed that the resulting preference measures (part-worths) are additive (Cosper et al 1984:226).

Conjoint analysis has been used to study preferences and perceptions of a variety of multi-attribute objects, from durable commodities to wilderness trails (see e.g. Cattin & Wittnik 1982; Cosper et al 1984; Raimondo 1985). The widespread support for conjoint analysis reflects the usefulness of the technique for representing the structure of respondent's preferences or perceptions, and for predicting respondent's behaviour towards new multi-attribute alternatives (Green & Srinivasan 1978:120). Conjoint analysis has apparently not previously been applied in the context of recreation settings. This study should therefore be viewed as exploratory, particularly since no work reported

to date has established what particular attributes distinguish recreation settings in South Africa. Nonetheless, indications are that this technique has considerable potential to provide useful information to recreation planners. The ability of conjoint analysis to generate relatively refined measurements and predictions from rather primitive data is particularly advantageous, given that work on the recreation opportunity spectrum concept is in an early stage of development.

6.3.1.2 Selecting Setting Attributes for the Cederberg

Local planners, managers and academics in the field of recreation considered setting attributes derived from the United States experience (see Figure 7) to be relevant in South Africa. Table 5 (see page 111) was developed as a foundation for distinguishing hypothetical recreation settings in the Cederberg. According to Blake (1982:12), there should be no more than four or five attributes, each measured at five or less levels, in a profile description. To reduce the amount of information contained in Table 5, to that which could be meaningfully assessed by respondents, particular attention was given to the following considerations:

(1) The minimum number of profiles needed to guard against interaction between attributes given Cosper & Kinsley's (1984:230) "rough rule of thumb".
(2) The need to limit the total number of profiles presented to respondents to prevent overloading respondents (Blake 1982:18).
(3) The recommendation by Blake (1982:13) that the part-worth of an attribute level not presented to respondents, but which lies between two specified attribute levels, can be calculated on the basis of interpolation. This facilitated the presentation of two attributes at only two levels. The total number of

TABLE 5: DISTINGUISHING ATTRIBUTES OF RECREATION SETTINGS FOR THE CEDERBERG

SETTING ATTRIBUTES	PRIMITIVE	SEMI-PRIMITIVE	SEMI-DEVELOPED	DEVELOPED
INTER-PARTY CONTACT SOCIAL INTERACTION				
(1) EXPECTATION	(1) UNEXPECTED	(1) ANTICIPATED	(1) EXPECTED	(1) CONVINCED
(2) OCCURRENCE	(2) RARE	(2) OCCASIONAL	(2) FREQUENT	(2) REGULAR
REGIMENTATION	ENVIRONMENT AND EXPERIENTIAL PROTECTION AND NO REGIMENTATION	ENVIRONMENT AND EXPERIENTIAL AND RECREATOR PROTECTION AND MODERATE REGIMENTATION	STRICT REGIMENTATION	OVERT AND STRICT REGIMENTATION
ACCESS				
(1) SYSTEM				
(a) ROADS	(a) NONE	(a) DIRT ROADS	(a) HIGH STANDARD DIRT ROADS	(a) TAR ROADS
(b) PATHS	(b) LOW STANDARD	(b) HIGH STANDARD; BRIDLE PATHS	(b) HIGH STANDARD; BRIDLE PATHS; PAVED	(b) HIGH STANDARD; PAVED
(2) MODE	(2) UNMOTORIZED; SELF CONVEYANCE	(2) UNMOTORIZED	(2) MOTORIZED & UNMOTORIZED	(2) MOTORIZED
MODIFICATION				
(1) FACILITIES				
(a) EXTENT	(a) NONE	(a) ISOLATED	(a) EVIDENT	(a) PERVASIVE
(b) APPARENTNESS	(b) NONE	(b) COVERT	(b) DISTINCT	(b) CONSPICUOUS
(c) COMPLEXITY	(c) NONE	(c) RUSTIC	(c) MODERN	(c) SOPHISTICATED
(d) AMENITIES	(d) NONE	(d) SPARTAN	(d) CONVENIENT COMFORTABLE	(d) LUXURIOUS
(2) IMPACTS				
(a) RECREATORS	(a) NEGLIGIBLE	(a) MINOR	(a) MODERATE	(a) PREVALENT
(b) NON-RECREATORS	(b) NEGLIGIBLE	(b) MINOR	(b) MODERATE	(b) PREVALENT
(3) NON-RECREATION	(3) NONE	(3) CIRCUMSCRIBED	(3) MODERATE	(3) EXTENSIVE

profiles that needed to be presented to respondents was thus reduced. The interpolation of part-worths however, later proved to be somewhat unsatisfactory (see Section 6.5.2). The rationale behind the selection and synthesis of attributes is discussed in Appendix B.2.1.

In this application of conjoint analysis four attributes, with two at two levels and two at three levels, were finally selected to distinguish hypothetical primitive, semi-primitive and semi-developed recreation settings for the Cederberg (see Table 6).

TABLE 6: ATTRIBUTES USED IN THE SURVEY TO DISTINGUISH RECREATION SETTINGS FOR THE CEDERBERG

SETTINGS	PRIMITIVE	SEMI-PRIMITIVE	SEMI-DEVELOPED
ATTRIBUTES:			
INTER-PARTY CONTACT	unexpected and rare	———	expected and frequent
ACCESS	no roads, unmotorised	———	gravel roads, motorised and unmotorised
SELECTING A ROUTE	plan own route	select from several permitted routes	instructed to follow specific route
VISITOR FACILITIES	none	overnight shelters	well-equipped chalets

The two by two, and two by three format contains 2 X 2 X 3 X 3 = 36 possible combinations of attribute levels. Only nine profiles however, need to be ranked to determine a measure on all possible attribute combinations.

Following a series of pre-tests, and given the experience of the pilot survey, a profile format was adopted that combined a scenario and key-word approach. An example of profiles

presented to respondents is presented below:

PROFILE ONE:	
INTER-PARTY CONTACT:	Rare and unexpected.
ACCESS:	A few gravel roads provide access for vehicles.
SELECTING A ROUTE:	Visitors may select one of the permitted routes.
VISITOR FACILITIES:	Well-equipped chalets.
PROFILE TWO:	
INTER-PARTY CONTACT:	Rare and unexpected.
ACCESS:	On foot.
SELECTING A ROUTE:	Visitors are told which route they must follow.
VISITOR FACILITIES:	Overnight shelters are provided.

Details concerning the question wording, response format and pre-testing are outlined in Appendix B.2. The analysis of the results of the setting question is discussed in Section 6.5.2.

6.3.2 Appropriate Activities for the Cederberg

One object of the survey was to ascertain visitor attitudes about appropriate recreation activities for the currently undeveloped area of the Cederberg. Respondents were asked to rate a list of activities according to the appropriateness of each for the Cederberg (See Appendix D).

The initial list of activities was drawn primarily from four sources (Grindley 1976; Pickles 1978:382; Andrag 1979:2,8; Andrag 1983:360-363). Only those activities considered to be practical for the area were included, so that the question was meaningful to respondents. This list of activities was modified in the light of pre-testing and the pilot survey. The final list included a range of activities that could be considered more or less appropriate for the Cederberg.

Attention was given to commonly perceived associations between activities and settings to provide a broad indication of the kind of setting visitors considered suitable for undertaking various activities. In a series of pre-tests, respondents were asked to indicate the kind of recreation setting (given the attributes outlined in Table 6) that they would associate with an activity in the context of the Cederberg. It emerged that some activities could be associated with more than one setting (see Figure 10). An indication of the range of settings perceived to be suitable for different activities was found to be useful in considering the implications of catering for various activities in the Cederberg (see Section 6.6).

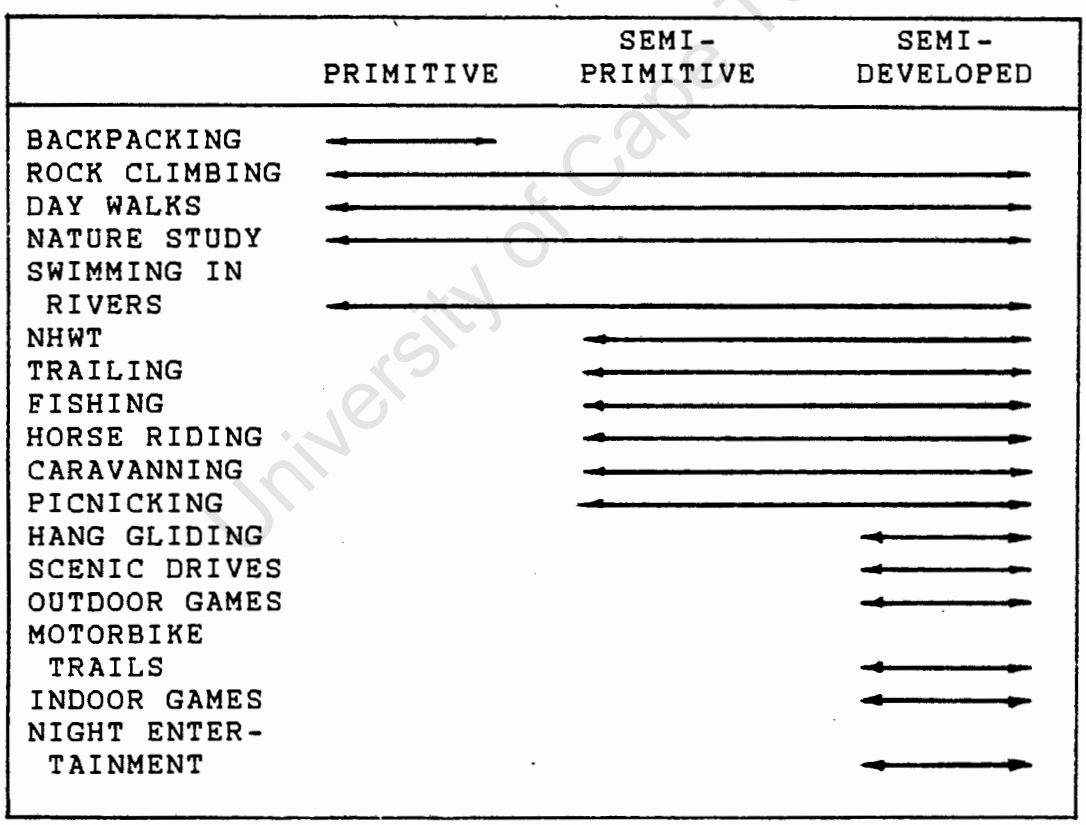


FIGURE 10: RECREATION SETTINGS ASSOCIATED WITH ACTIVITIES IN THE CONTEXT OF THE CEDERBERG

Further details on the design and construction of the activities question, are outlined in Appendix B.3. The analysis of the results of this question is outlined in Section 6.5.3.

6.3.3 Important Experiences in a Visit to the Cederberg

The survey also sought evidence to highlight the relative importance of experiential considerations to Cederberg visitors. Respondents were asked to rate a list of experiences according to the importance of each in a visit to the area. The focus of this question is the "on-site" experience (see Section 4.2), which may provide the greatest satisfaction to visitors (Hammitt 1980:112) and thus be of most importance to them.

The study of recreation experiences is a complex undertaking (see e.g. Driver 1975). People participating in different activities obviously may have different experiences (see e.g. Driver 1976; Brown 1981). People participating in the same activities may however, also have different experiences (see e.g. Manfredo, Brown & Haas 1980; Haas, Driver & Brown 1980). Pickles (1978:391) found that visitors to the Drakensberg had difficulty in distinguishing different aspects of their recreation experience. To enable respondents to separate parts of their experience, and to assess their relative importance, a number of experience categories have been identified (see e.g. Driver 1975; Pickles 1978; Brown & Haas 1980; Manfredo, Driver & Brown 1983). The experience categories that were used in compiling the initial list of experiences for this question are outlined in Figure 11 (page 116). This list provided a starting point for pre-testing this question (see Appendix B.4.2).

The list of experience categories and descriptive phases used in the experiences question is outlined in Figure 12 (page 117).

Details regarding the design and construction of the experiences question are outlined in Appendix B.4. The analysis of the results of this question is outlined in Section 6.5.4.

PICKLES (1978:403)	BROWN & HAAS (1980:230)	MANFREDO, DRIVER & BROWN (1983:271)
Aesthetic	Relationships with nature	Relationships with nature
Physical	Escape Pressures	Solitude-Tranquility
Relaxational	Achievement	Exercise-Physical fitness
Solitary	Autonomy	General Learning
Emotional	Reflection on Personal Values	Escaping Personal & Social Pressure
Educational	Sharing/ Recollection	Autonomy
Social	Risk Taking	Being with Similar People
Anticipatory and Reflective	Meeting/Observing Other People	Achievement Self-Realisation Family Togetherness Security Risk Taking Leadership Meeting/Observing new People

FIGURE 11: RECREATION EXPERIENCE CATEGORIES

EXPERIENCE CATEGORIES	DESCRIPTIVE PHRASES
AESTHETIC	Enjoying the Scenery
LEARNING	Learning about the natural history of the area
EXERCISE	Physical exercise
ESCAPE PRESSURES	Getting away from daily pressures
PIONEER SPIRIT	Facing challenge, risk and uncertainty
ACHIEVEMENT/ SELF-REALISATION	Gaining a sense of achievement; realising potential
SOCIALISING	Meeting other people
FAMILY/FRIEND TOGETHERNESS	Strengthening family and/or friendship bonds
SOLITARY	Solitude
RELIGIOUS/SPIRITUAL	Fellowship with God and/or Nature

FIGURE 12: EXPERIENCE CATEGORIES AND DESCRIPTIVE PHRASES USED IN THE SURVEY

6.4 Conducting the Survey

A pilot survey was undertaken to examine the conceptual basis of the survey, to assess the questionnaire design and construction, and to review the data analysis procedure (see Appendix C).

6.4.1 The Sample

According to visitor records, the total number of visitors to the Cederberg during the year 1 November 1984 to 31 October 1985 was 14262. An equal number of hikers and campers visited the Cederberg during the year, namely 4254 (i.e. 30% each)

and a total of 5754 bungalow visitors (40%) stayed overnight in the Cederberg during the same period. These figures are approximate in that some visitors did not indicate the number of people in their party. In such cases the average group size per month was multiplied by the number of such groups and added to the specified number of visitors to give an approximate total number of visitors per month, and hence for the year. Table 7 reflects the number of visitor groups to the Cederberg during the year and the calculation of the sampling frame.

TABLE 7: SELECTING A SAMPLE OF VISITORS TO THE CEDERBERG FROM 1 NOVEMBER 1984 TO 31 OCTOBER 1985

	SAMPLE	HIKERS	CAMPERS	BUNGALOW VISITORS
TOTAL NO. OF GROUPS	3118	871	1054	1193
NO. OF GROUPS EXCLUDED	227	78	50	99
NO. OF FOREIGN GROUPS	43	7	20	16
SAMPLING FRAME	2848	786	984	1078
SAMPLE (10%)	284	79	98	107

A total of 227 (8%) visitor groups were excluded from the sampling frame because the name and/or the address of group leaders were illegible or incomplete. A further 43 foreign visitor groups were excluded because of their probable limited knowledge of recreation opportunities in the area. The total sampling frame was thus 2848 visitor groups.

The determination of the appropriate sample size was primarily influenced by statistical considerations. These relate to the examination of the hypothesis (H1) that the attitudes of hikers, campers and bungalow visitors differ

with regard to appropriate activities and important experiences in a visit to the Cederberg. (Inferential statistical tests have not as yet been developed for conjoint analysis and could not therefore be used in examining this hypothesis in the context of recreation settings [Blake 1982:34]). In order to test the null hypothesis (Ho) that no such differences existed, chi-square tests were performed on the activity and experience rating frequencies of visitor groups. The test of Ho examines the statistic:

$$\chi^2 = \sum_{i=1}^{r}\sum_{j=1}^{k} \frac{(O_{ij}-E_{ij})^2}{E_{ij}}$$

where Oij = the observed number of cases categorised in the ith row of the jth column, i.e. observed ijth cell frequency.

where Eij = the number of cases expected under the Ho to be categorised in the ith row of the jth column.

The values of χ^2 are distributed approximately as chi-square with

$$df = (r-1)(k-1)$$

where r = the number of rows, and

k = the number of columns in the contingency table.

If the probability of χ^2 values being larger than the observed statistic is equal to or less than the chosen level of significance, Ho is rejected and H1 is accepted. A 5% level of significance was considered to be appropriate for this exploratory survey. At the 5% level there is a non-zero probability of failing to reject a false Ho (i.e. making a type II error), but this diminishes as sample size (i.e. $n=\sum\sum O_{ij}$ = the number of observations [respondents]) increases. If Ho is rejected however, one can be 95% confident in doing so. The chance of mistakenly rejecting a true Ho (i.e. type I error) is restricted to 5% by the choice of the significance level (see e.g. Siegel 1956; Rayner 1967; Lutz 1983).

The bigger the cell frequencies the more reliable the conclusions drawn, but by progressively smaller amounts. Roughly speaking, reliability depends on the standard deviation of averages, which involves a factor ($\frac{1}{\sqrt{n}}$). The final sample size selected has to balance this consideration with available resources (Bentham et al 1982:368). Generally it is recommended that the minimal cell frequency should exceed five observations (Underhill 1985:300). This objective seemed to be readily achievable by using a 10% sampling ratio, which allowed for a notional frequency of 21 per cell for each of 3 X 4 = 12 cells. This sample size proved adequate.

To obtain the sample, a number between one and ten was chosen from a table of random numbers and thereafter, every tenth visitor group was selected. The main advantage of systematic random sampling is ease of administration. A systematic random sample ensures that each group has equal chance of selection. In practice systematic random sampling is considered to be virtually identical in effect to simple random sampling. Moreover, because the visitor records were ordered according to the date of visit, systematic sampling provides stratification by date of visit whereas a simple random sample would not. Systematic random sampling, in this case, is likely to be more representative than simple random sampling because visitor groups to the Cederberg throughout the year are represented in the sample (Babbie 1973:92-96).

6.4.2 Monitoring Returns and Follow-ups

Questionnaires were posted by bulk-mail to respondents. A self-addressed, postage-paid envelope and the set of nine cards for the setting question were clipped to the questionnaire.

A total of 178 completed questionnaires were received. This yielded a response rate of 63%. No unusable questionnaires

were received, but several respondents did not complete every question. Each completed question was used in the analysis of the results. Nine questionnaires were returned uncompleted because addressees were untraceable. Figure 13 reflects the weekly return of questionnaires. In the first week of receiving questionnaires 44% of the questionnaires were returned. This dropped off to 22% in the second week.

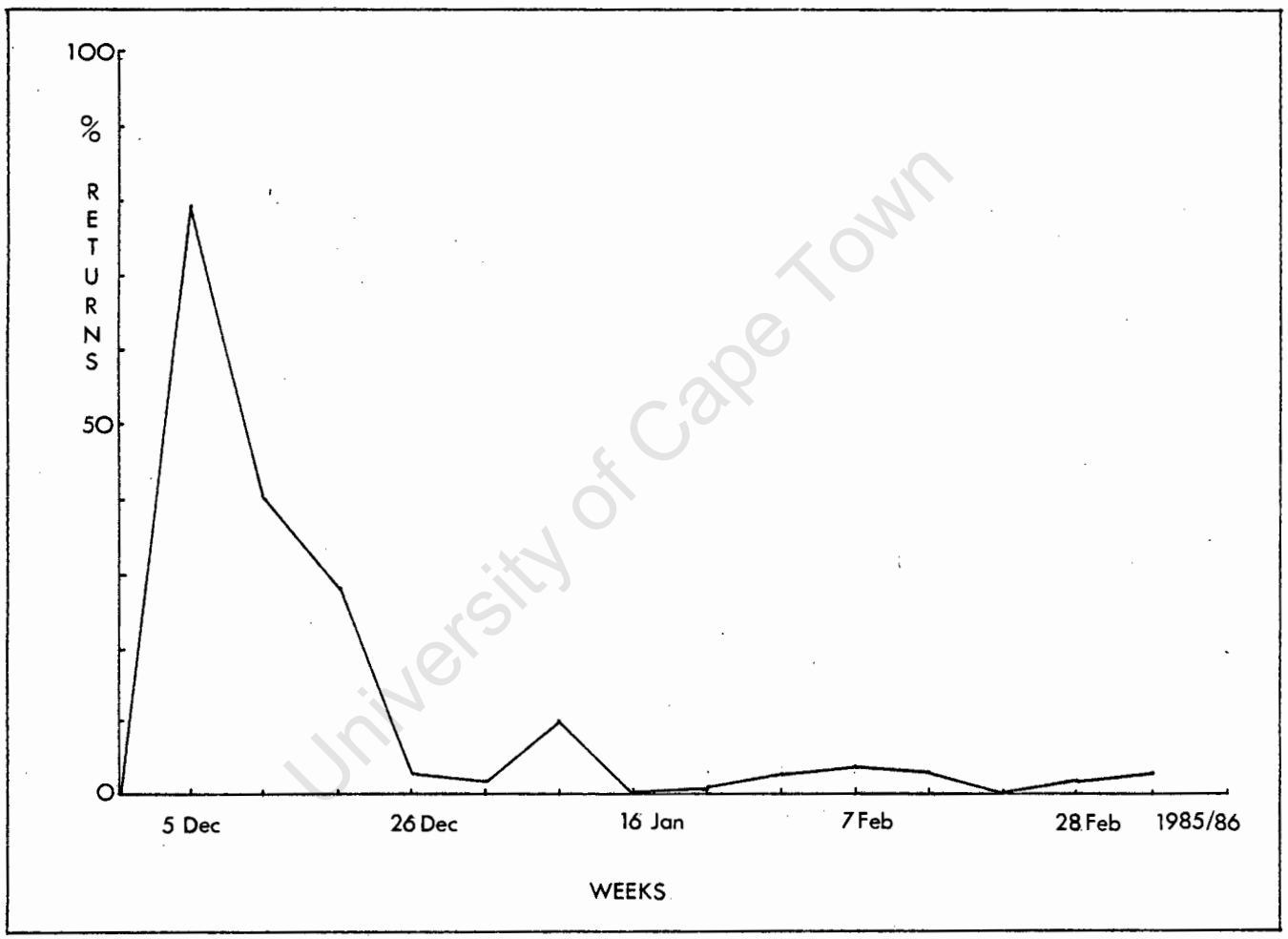


FIGURE 13: WEEKLY RETURN OF QUESTIONNAIRES

A telephonic follow-up was selected for the following reasons:

(1) The personal contact might stimulate more response than a mail follow-up.

(2) Most of the sample (93%) were from the suburbs of Cape Town and the south west Cape and environs. It would thus be relatively inexpensive to contact them by telephone.
(3) Contact would be made with visitors who might not otherwise respond to a mail survey. In this way sample bias should be reduced.
(4) This means of follow-up provided an internal checking system to ensure that visitors had received the questionnaire in the first place; that it was in the right language medium; that any difficulties encountered in the completion of the questionnaire could be resolved; and that any reluctance to return the questionnaire could be noted.
(5) It was more time-efficient than a mail follow-up.

One disadvantage of a telephonic follow-up is that people from a low socio-economic background may not have telephones. This was not considered to be of concern in this instance because visitors to the Cederberg come mainly from middle to upper socio-economic brackets (Andrag 1977:111).

Telephone numbers of 65% of the sample were obtained. Telephone numbers were obtained for 66% of hikers, 60% of campers and 69% of bungalow visitors. To stimulate response, the first follow-up was undertaken 10 days after the first completed questionnaire had been returned. A total of 123 calls were made to visitors who had not as yet returned questionnaires. The results are reflected below:

Does not live here:	3
Never received questionnaire - please send one:	7
Would like another and will return:	24
Does not intend to return:	5
Intends to return as soon as possible:	36
Sent back already:	10
Could not contact:	38
TOTAL:	123

The telephone follow-up did not have an obvious influence on the response rate, which continued to decline albeit at a slower rate, from the second to the third week. The response rate continued to decline at a more rapid rate from the fourth to the fifth week. The slight increase in response from the fifth to sixth week may be attributed to people completing the questionnaire on returning from holiday. It was decided to conduct a second telephonic follow-up over the weekend of 17 to 18 January 1986, when more people would have returned from holiday. The same conversation format was used as before. A total of 73 calls were made to visitors who had not returned questionnaires. The results are outlined below:

Does not live here:	0
Never received questionnaire - please send one:	2
Would like another and will return:	24
Does not intend to return:	4
Intends to return as soon as possible:	15
Sent back already:	2
Could not contact:	26
TOTAL:	73

The overall response rate of 63% exceeded expectations given the complexity of the questionnaire and the fact that some visitors may not have been to the area for a year.

6.5 Survey Results

The data from each completed questionnaire was coded and systematically stored on computer diskette. Data from all 178 respondents could be used in the analysis of questions. In the activities and experiences questions however, several respondents either omitted to rate or double rated some considerations. The sample size was adjusted accordingly in these cases. The stored data was double checked to ensure that it had been correctly entered. Several computer programmes were developed (in BASIC) to facilitate timeous computation.

6.5.1 A Profile of Visitors to the Cederberg

Amongst visitors to the Cederberg there is a predominance of English-speaking males between the ages of 25 and 44 years (see Table 8).

TABLE 8: VISITOR GROUP PROFILE ACCORDING TO AGE, SEX AND LANGUAGE

	SAMPLE (%)	HIKERS (%)	CAMPERS (%)	BUNGALOW VISITORS (%)
AGE (YRS)				
15-24	9	13	10	3
25-34	33	32	34	33
35-44	30	20	31	37
45-54	11	20	7	8
55-64	14	15	15	13
65+	3	0	3	6
SEX				
MALE	81	89	85	70
FEMALE	19	11	15	30
LANGUAGE				
ENGLISH	75	65	72	86
AFRIKAANS	25	35	28	14
	n=178	n=54	n=61	n=63

Only slight differences are apparent between the three visitor groups. There are apparently more hikers in the 45-54 year age group than in the other groups. Although this profile suggests that there are more female bungalow visitors than female hikers or campers, this suggestion should be interpreted with caution. It may simply be a reflection of the relatively low number of female "group leaders" in the hiker and camper categories. Amongst bungalow visitors, English speakers predominate.

6.5.2 The Appropriate Recreation Setting

Visitor attitudes about the appropriate recreation setting

for the area were determined by an application of conjoint analysis to the visitor responses collected in the survey. The MONANOVA programme developed at the Graduate School of Business (University of Cape Town) could only process data from a maximum of 55 respondents at one time. This capacity could not be expanded for this study. To obtain an overall assessment of visitor attitudes, two sets of conjoint analysis results were generated in separate runs on the MONANOVA programme. These results were then compared to establish whether or not they appeared to be from the same population.

To obtain distinct sets of 55 responses, two sets of data were systematically drawn from the total of 178 responses. The responses were arranged from the first to last questionnaire received. In the first set (conjoint 1) every third response, beginning at respondent number two, was chosen. In addition, four randomly selected responses that had been included in the set were omitted. In the second set (conjoint 2) every third response, beginning at respondent number three, was chosen. In addition, four randomly selected responses that had been included in this set were omitted. In this way two distinct sets of 55 responses each were obtained. The results of conjoint 1 and conjoint 2 are outlined in Table 9 (page 126).

For an explanation of how the percentage importance of the attributes was calculated see Appendix F. Differences of no more than three percent were found in comparing the percentage importance of attribute levels derived in conjoint 1 and conjoint 2. Since each set of results reflects an average of 55 visitor attitudes, these differences were considered to be small enough for each set of results to have originated from the same population (see also Figure 14, page 131). No inferential statistical tests currently exist to facilitate a more rigorous assessment of these differences (Blake 1982:34). It would have been preferable to have

examined the entire set of 178 responses simultaneously, had the available software been adequate, but it was necessary to use average values of attribute importance.

TABLE 9: THE PERCENTAGE IMPORTANCE OF ATTRIBUTES IN DEFINING THE APPROPRIATE RECREATION SETTING FOR THE CEDERBERG, ACCORDING TO ALL RESPONDENTS

RESPONDENTS	CONJOINT ONE			CONJOINT TWO			AVERAGE		
SETTINGS	P	SP (%)	SD	P	SP (%)	SD	P	SP (%)	SD
ATTRIBUTES:									
INTER-PARTY CONTACT	27	--	0	24	--	0	25	--	0
ACCESS	23	--	0	22	--	0	22	--	0
SELECTING A ROUTE	29	25	0	32	23	0	31	24	0
VISITOR FACILITIES	0	20	10	0	23	12	0	22	11
TOTAL	79	--	10	78	--	12	78	--	11

KEY: P = PRIMITIVE SP = SEMI-PRIMITIVE SD = SEMI-DEVELOPED

The ideally appropriate setting was characterised by rare and unexpected contact with other parties, access to the area on foot, the opportunity for visitors to select their own route and the provision of overnight shelters. This combination of attributes can be rated as 100%. It can be inferred that the primitive setting achieves a 78% rating against the ideally appropriate setting. The semi-developed setting achieves only an 11% rating against the ideal (Stewart, pers. comm.). Despite Blake's (1982:13) suggestion regarding the feasibility of interpolation, the rating value of the semi-primitive setting could not be predicted with confidence. There was no acceptable method of interpolating inter-party contact and access at this level. Blake's suggestion

presupposes a linear rating between the settings, but no such relationship was apparent in the data (see Figure 14). Despite the absence of any formal rating at the semi-primitive level, it may be reasonable to suggest a range of values for the inter-party contact and access attributes given ratings of the activities and experiences questions (Stewart, pers. comm.) (see Section 6.5.3 and 6.5.4). These hypothetical attribute values are presented in the discussion below to give a coherent impression of the ratings, rather than to provide either a statistical description or prediction.

To 83% of all visitors the opportunity to experience solitude was important or very important, whereas only 13% considered meeting other people to be important or very important. Activities usually associated with a degree of modified access and occasional contact with other parties, e.g. National Hiking Way Trails (NHWT) (69%), picnicking (55%) and caravanning (55%), were considered to be appropriate or fairly appropriate by the majority of visitors. It may therefore be reasonable to suggest a range of rating values from 10-30% for the inter-party contact and access attributes at the semi-primitive level. Based on these hypothetical attribute values, the semi-primitive setting might be expected to achieve a total rating of more than 65%. These results suggest that the majority of visitors may consider limited development, such as the provision of overnight shelters, to be appropriate for the Cederberg. Such modification would however, conflict with the current management policy for the area (see Section 2.3.2) and is likely to be opposed by some visitors.

Differences between the three visitor groups were expected regarding the appropriate setting for the area. Based on the submissions to the investigating committee of the Council for the Environment by various mountain clubs (see Section 2.4.1), it was expected that the primitive setting would be

appropriate or fairly appropriate to the majority of hikers. Thus for hikers it might be reasonable to assume that inter-party contact and access at the semi-primitive level would each achieve a rating of 10-15%. On this basis, the semi-primitive setting would achieve a rating of 50-60% of the ideally appropriate setting for the Cederberg.

For 80% of campers and 87% of bungalow visitors the opportunity to experience solitude was considered to be important or very important. Only 18% of campers and 9% of bungalow visitors considered meeting other people to be important or very important. Activities such as NHWT, picnicking and caravanning were seen to be considerably more appropriate for the Cederberg by campers (73%, 67% and 68%) and bungalow visitors (79%, 52% and 56%) than hikers (52%, 44%, 38%). For the camper and bungalow visitor groups the inter-party contact and access attributes at the semi-primitive level might therefore be rated in the range of 10-30%. On this basis the semi-primitive setting would be expected to achieve a rating of at least 65%, but probably more, of the ideally appropriate setting for campers and bungalow visitors. Thus in contrast to the other visitor groups, hikers consider the primitive setting to be substantially more appropriate for the area than a semi-primitive setting. Hikers would therefore oppose any further modification of recreation opportunities in the Cederberg, whereas the other groups would support limited development and associated activities, such as the provision of overnight shelters for a NHWT.

For planners and managers to determine which setting attributes visitors consider to be appropriate for an area, an understanding of the relative importance of setting attributes is required. Conjoint analysis facilitates assessment of these values. Raimondo (1985:47-48) outlined an approach to measure the relative importance of attributes (see Appendix F). Based on this approach, an average visitor

rated the relative importance of attributes in defining an appropriate setting for the Cederberg as: selecting a route (31%); inter-party contact (25%); access (22%); and visitor facilities (22%) (see Table 9). There was little difference in the attitudes of hikers, campers and bungalow visitors in this regard. In contrast to hikers and campers, bungalow visitors considered the opportunity to select one of several permitted routes to be slightly more important than planning one's own route. The relative importance of the attribute "selecting a route" reflects the significance all visitors attach to the imposition of management restrictions and controls.

A more refined measure of attribute importance, focussing on the relative importance of attribute levels, can be derived from Figure 14 (page 131). The slope of each function indicates the effect of a change in the level of an attribute (x-axis) on the perceived appropriateness (y-axis) of the recreation setting (Stewart, pers. comm.). It is evident that differences between conjoint 1 and conjoint 2 are negligible. The change in attribute level that contributes most to describing the appropriate setting for the Cederberg was: the opportunity to select from several permitted routes rather than to be instructed to follow a specific route (slope = -1.60). The provision of overnight shelters, rather than no visitor facilities, was the next most important consideration to visitors (slope = 1.47). The relative importance of the semi-primitive level of the attributes inter-party contact and access could not be predicted with confidence. Given the range of values suggested for these attributes however, it is likely that a change in both these attributes from the semi-developed to semi-primitive level is more important than a change from the semi-primitive to primitive level. Furthermore, it is likely that the change from the semi-developed to semi-primitive level of inter-party contact is more important to visitors than the same change for the access attribute.

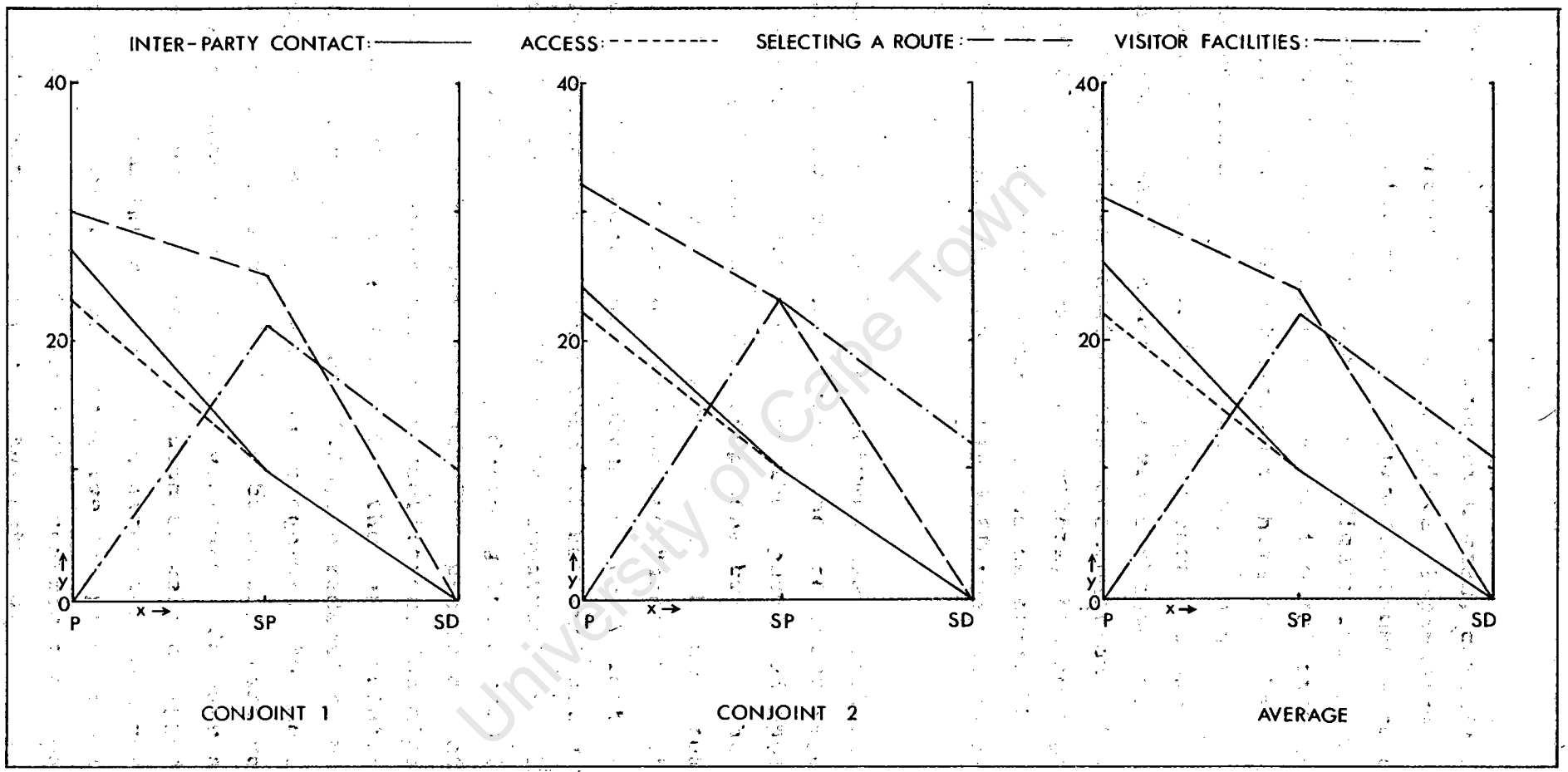


FIGURE 14: THE RELATIVE IMPORTANCE OF ATTRIBUTES IN DEFINING THE APPROPRIATE RECREATION SETTING FOR THE CEDERBERG, ACCORDING TO ALL RESPONDENTS

KEY: P:PRIMITIVE
SP:SEMI-PRIMITIVE
SD:SEMI-DEVELOPED

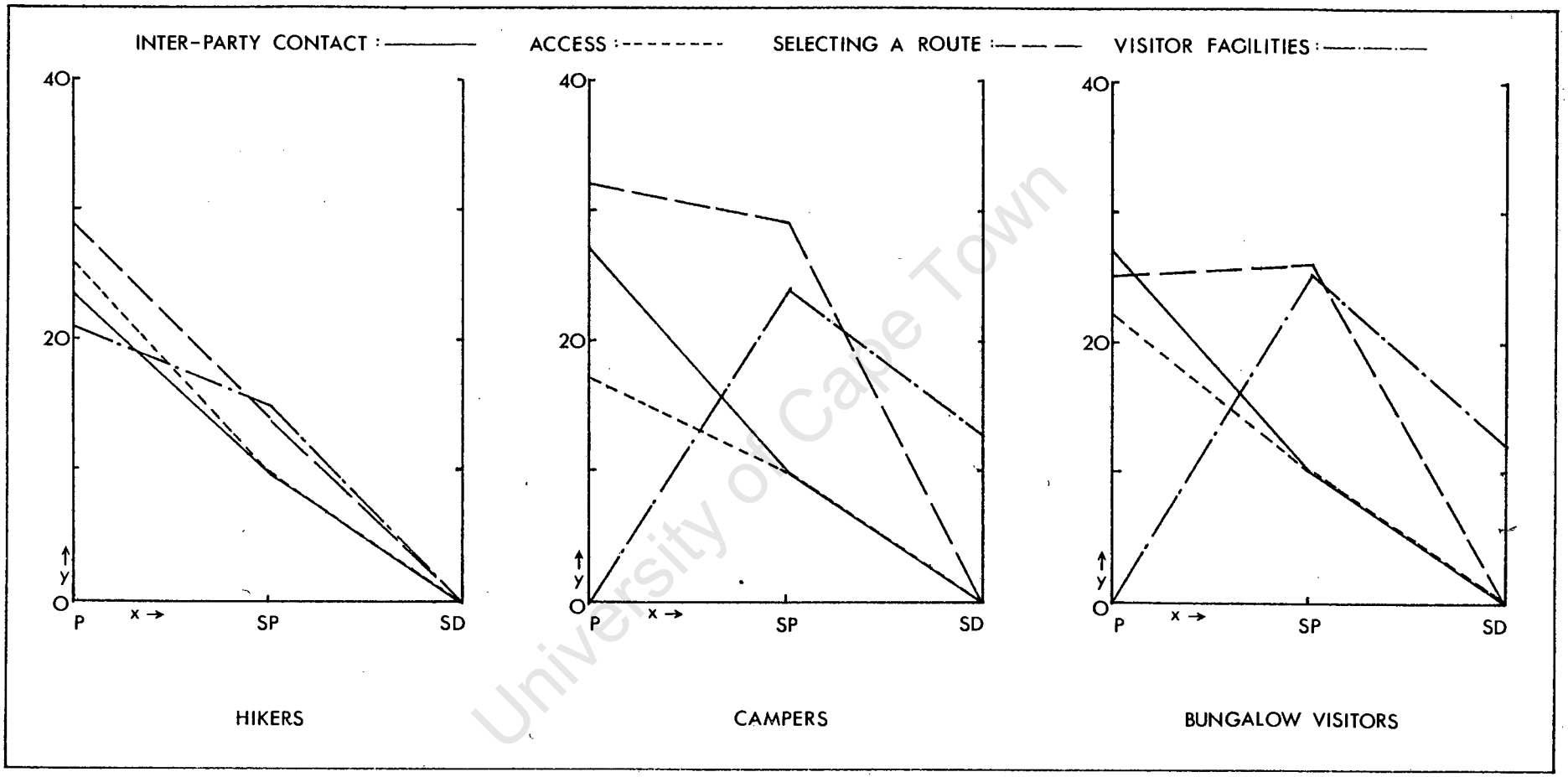


FIGURE 15: THE RELATIVE IMPORTANCE OF ATTRIBUTES IN DEFINING THE APPROPRIATE RECREATION SETTING FOR THE CEDERBERG, ACCORDING TO VISITOR GROUPS

KEY: P:PRIMITIVE
SP:SEMI-PRIMITIVE
SD:SEMI-DEVELOPED

In conclusion, any future plan that proposes additional management restrictions and controls, visitor use, facilities or improved access, for the currently undeveloped area of the Cederberg is likely to be vigorously opposed by hikers. By comparison, campers and bungalow visitors are likely to support a proposal that provides additional overnight shelters in the area. An increase in management restrictions and controls, such as limiting the choice of route, is not likely to be opposed by campers and may even be preferred by bungalow visitors. Campers in particular are not likely to be strongly opposed to improving access to the area. A proposal that results in increased levels of visitor use is however, likely to be opposed by both campers and bungalow visitors.

6.5.3 Appropriate Activities

To the majority of visitors, backpacking (95% of visitors); day walks (95%); rock-climbing (95%); nature study (94%); swimming in rivers (90%); hiking on NHWT (69%); caravanning (55%); picnicking (55%); and fishing (51%) were considered to be fairly appropriate or appropriate for the Cederberg. Current management policy permits activities such as backpacking, rock-climbing, photography, bird-watching, and swimming in rivers in the Cederberg (Bands undated:58). Hiking on NHWT, caravanning and picnicking are however, likely to conflict with existing management policy. These activities are usually associated with a semi-primitive setting characterised by: more management restrictions and controls; more modified access; more extensive visitor facilities; and more frequent visitor contact than currently provided by the present wilderness management policy.

A priori differences were expected in the attitudes of hikers, campers and bungalow visitors regarding the appropriateness of several activities for the currently undeveloped area of the Cederberg. Variations in activity patterns and preferences have been observed in the Cederberg

(Viviers, pers. comm.; Mrs O. Nieuwoudt, pers. comm.) and were apparent in the results of the pilot survey (see Appendix C.3). In addition, differences in visitor group's activity preferences have been reported elsewhere in South Africa (see e.g. Pickles 1978; Sutcliffe 1979). More specifically, it was anticipated that the perceived appropriateness of activities associated with more developed settings e.g. scenic drives, outdoor games and night entertainment, would increase from hikers to campers to bungalow visitors. Fairly substantial differences were apparent in the data (see Figure 16, page 136).

In examining the Ho that no such differences existed, chi-square tests were performed for all possible combinations of activity rating frequencies. It became necessary to merge categories because the chi-square test can only be applied in cases where at least 80% of the expected cell frequencies are not less than five (Haynes 1982:134). In performing 153 independent chi-square tests it is possible that some values attain significance due to chance effects alone. From a conservative point of view, one might have expected seven of the significant results (at the 5% level) to be attributable to chance. The occurrence of 13 or more significant results in 153 such tests has a probability close to the 5% level. There is however, incontrovertible statistical evidence against the Ho because 14 significant results were actually obtained (see Table 11, page 137). This approach is designed to compensate more than adequately for applying the same level of significance in repeated analyses of the data, though in practice the analyses are not independent (Dunne, pers. comm.). In addition, the chi-square values were calculated using Yate's correction for chi-square with one degree of freedom, which has the effect of making the judgement of significance even more conservative (Rayner 1967:296-297). One may therefore confidently conclude that the largest chi-square statistics represent conservative evidence that substantial visitor group differences exist.

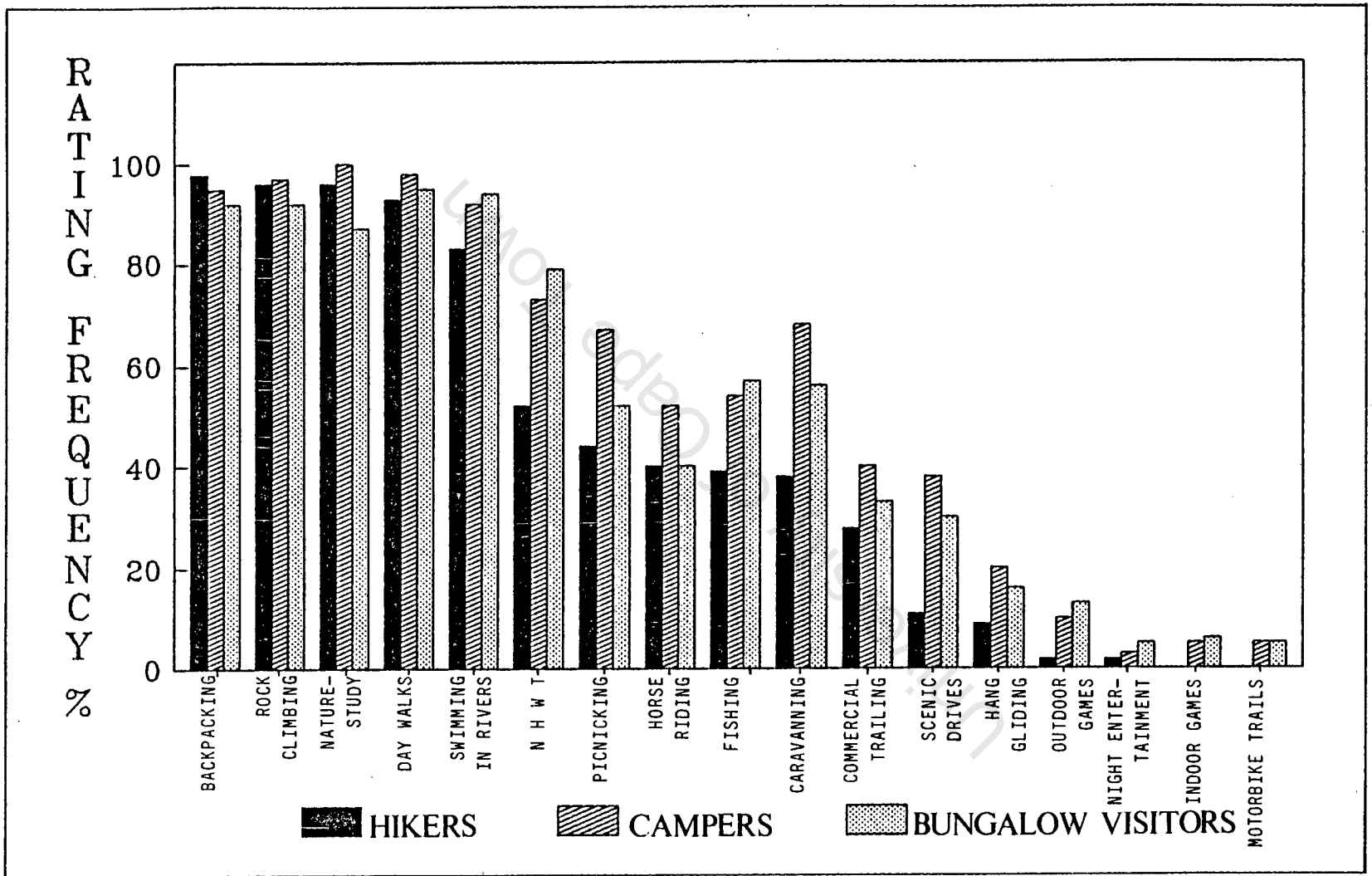


FIGURE 16: THE PERCENTAGE FREQUENCY ACTIVITIES WERE RATED "FAIRLY APPROPRIATE" AND "APPROPRIATE" BY VISITOR GROUPS TO THE CEDERBERG

Contrary to *a priori* expectations there was little evidence of significant differences in the attitudes of campers and bungalow visitors. There were however, unexpected differences between these two groups regarding the appropriateness of caravanning and possibly nature study. This result might be explained by the vested interest campers have in caravanning. As expected there was substantial evidence of differences between hikers and campers, and hikers and bungalow visitors. The former groups differed sharply in their perceptions of the appropriateness of caravanning. Surprisingly, there was no evidence of such differences between the latter groups. The perceptions of hikers and the other groups regarding the appropriateness of NHWT, scenic drives and outdoor games differed significantly. These activities are usually associated with settings characterised by access via constructed paths or gravel roads, a degree of management control, occasional to frequent contact with other parties, and the provision of some visitor facilities.

TABLE 11: SIGNIFICANT CHI-SQUARE VALUES OBTAINED FOR DIFFERENCES BETWEEN VISITOR GROUPS' ACTIVITY RATING FREQUENCIES

	Hikers vs. Campers			Hikers vs. Bungalow Visitors			Campers vs. Bungalow Visitors		
	1	2	3	1	2	3	1	2	3
BACKPACKING									
ROCK CLIMBING									
NATURE STUDY									3.866
DAY WALKS									
SWIMMING IN RIVERS									
NHWT		4.751			10.341				
PICNICKING		4.823							
HORSE RIDING									
FISHING									
CARAVANNING		9.410	11.715						12.569
COMMERCIAL TRAILING									
SCENIC DRIVES	7.153	9.394		4.419	4.979				
HANG GLIDING									
OUTDOOR GAMES				6.809					
NIGHT ENTER-TAINMENT	3.858								
INDOOR GAMES									
MOTORBIKE TRAILS	4.484								

KEY:
1. Inappropriate versus fairly inappropriate, fairly appropriate and appropriate
2. Inappropriate and fairly inappropriate versus fairly appropriate and appropriate
3. Inappropriate, fairly inappropriate and fairly appropriate versus appropriate

The differences between hikers and the other groups regarding the appropriateness of these activities therefore corroborates the evidence of differences between these groups obtained by conjoint analysis. Contrary to expectations, the differences between these groups was essentially limited to activities associated with a semi-primitive setting. As had been anticipated, activities such as backpacking and rock-climbing, usually associated with a primitive setting, were perceived by all visitor groups to be appropriate for the area. The consensus between all groups regarding the inappropriateness of activities such as indoor games and night entertainment, usually associated with more developed settings, was however unexpected.

6.5.4 Important Experiences

To more than 90% of visitors the opportunity to enjoy the scenery (100% of visitors); fellowship with God and/or nature (94%); and get away from daily pressures (93%) was important or very important in a visit to the Cederberg. Gaining a sense of achievement (48%); facing challenge, risk and uncertainty (37%); and meeting other people (13%) were not seen to be important or very important to the majority of respondents. Gaining a sense of achievement and facing challenge, risk and uncertainty tend to be associated with primitive recreation opportunities. These results may therefore provide tentative support for the notion that the majority of visitors to the Cederberg would consider limited modification of existing recreation opportunities to be appropriate.

The extent to which hikers, campers and bungalow visitors realise various experiences is likely to differ, because there are differences in the extent of modification, visitor use and management control in different areas of the Cederberg. Experiences associated with a primitive setting were expected to be more important to hikers than to campers

and in turn to bungalow visitors. A priori differences were therefore expected between the three visitor groups regarding the importance of experiences such as exercise, pioneer spirit, achievement, socialising, solitude and religious/spiritual. Some differences were apparent in the data (see Figure 17, page 140).

The chi-square test was used to examine the Ho that no such differences existed. Conservatively speaking in 90 such tests one might have expected four significant results (at the 5% level) to have been obtained by chance effects alone. Only two significant results were obtained. Therefore, there is not sufficient statistical evidence to confidently reject the Ho. There may nonetheless, be evidence that more hikers than campers (χ^2_y = 4.196) and bungalow visitors (χ^2_y= 4.000) consider the opportunity to face challenge, risk and uncertainty to be important or very important in a visit to the area.

A possible reason for the weak evidence against the Ho, despite the apparent differences in experience opportunities in the Cederberg, is suggested. There may be substantial differences in the extent to which different visitor groups actually realise some experiences (viz. the levels of solitude experienced by hikers compared to bungalow visitors). Each group may however, have a different understanding of the import of the experience in question because this understanding is relative to their other life experiences. In order to assess differences in the relative importance of experiential considerations to visitor groups, it is necessary to specify more precisely what is implied by each consideration and to ascertain that they are in fact comparable. These results must therefore be viewed as exploratory. Recent research on the relationships between recreation settings and experiences has highlighted the complexity of such studies (Schreyer et al 1985:17).

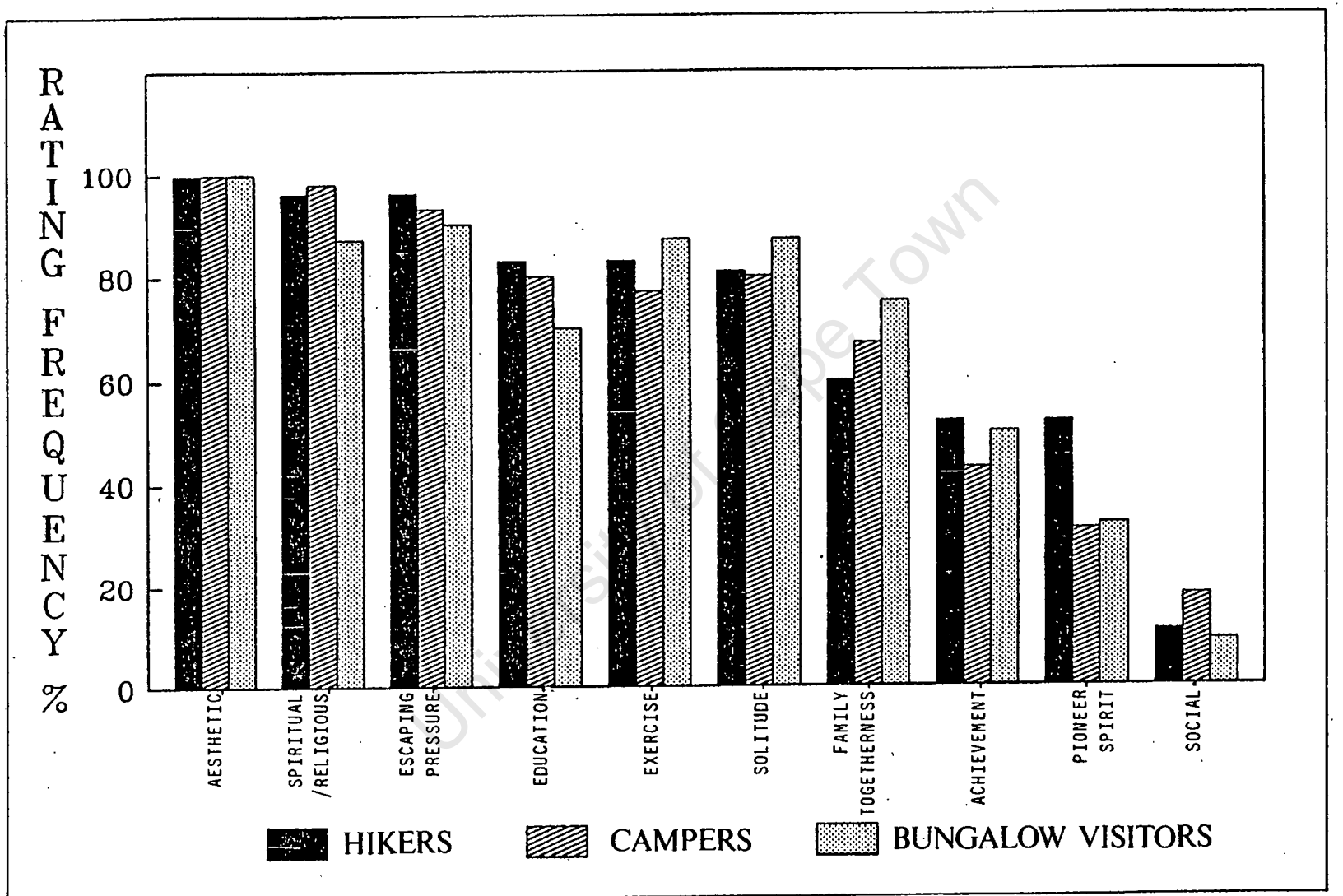


FIGURE 17: THE PERCENTAGE FREQUENCY EXPERIENCES WERE RATED "IMPORTANT" AND "VERY IMPORTANT" BY VISITOR GROUPS TO THE CEDERBERG

Moreover, the assumption that experiential variations exist as one moves along a primitive-urban continuum has not yet been conclusively demonstrated. This assumption is now the source of vigorous debate in environmental psychology (Williams & Knopf 1985:365-367).

6.6 Implications for Planning the Future Recreation Use of the Cederberg

Most of the submissions to the Cederberg investigating committee by outdoor recreation enthusiasts were opposed to further development in the Cederberg (see Section 2.4.1). It was therefore surprising that on average visitors may consider more developed recreation opportunities to be appropriate for the area. Although the survey was exploratory, the results draw attention to a dilemma facing planners in determining the appropriate future recreation use of the area.

On the one hand, planners may feel obliged to cater for the demands of the majority of visitors, and allow additional development in the area. This notion is likely to be reinforced when the preferences and needs of other interest groups are taken into account. Visitors to the Cederberg represent a relatively affluent, but small proportion of society and demonstrate a preference for nature-oriented recreation opportunities. It is therefore, reasonable to assume that there would be widespread support from the general population for further development of recreation opportunities in the area.

On the other hand, planners may feel obliged to cater for the interests of hikers, who have had a long association with recreation in the Cederberg (see Section 2.2.1). By allowing further development however, conditions in the area would become incompatible with the expectations and preferences of hikers. They would either have to adapt to the new

conditions, accepting a less satisfying experience, or be displaced by other visitor groups who find the new conditions consistent with their expectations and preferences. Catering for the interests of hikers may however, invite charges of discrimination and elitism.

The ROS concept seeks to provide planners with a basis for resolving this dilemma.

> If a full range of opportunity settings is provided [in a regional context], changes in demand can be more easily accommodated because the kinds of features an activity requires are more likely to be made available. Although the supply to meet the increased demand might be insufficient, nonetheless some areas with the necessary features should be available. Management of the full opportunity spectrum should permit accommodation of these changes with minimum disruption. Providing opportunities for quality recreational experiences means providing sufficient opportunities across the spectrum. Diversity is the key to meeting this challenge (Clark & Stankey 1979[a]:26).

But there is a potentially irreconcilable conflict between catering for visitor demands and maintaining diverse recreation opportunities. This conflict has not been adequately addressed in the ROS literature. If planners were to accommodate the changing demands of visitors to the Cederberg, a process of incremental development may be stimulated. With a relatively limited recreation resource base, and rising demands, this process may result in increasing homogeneity of recreation opportunities in the area. Displaced visitor groups, such as hikers, may not be able to find acceptable substitute opportunities in the region and thereby incur a permanent welfare loss. In addition, the modification of recreation opportunities may "spill-over" onto non-recreation resources imposing other significant costs on society (see Section 2.3.1).

Even if aggregate visitor satisfaction remains high, increasing the intensity of recreation development in the Cederberg is not likely to provide a lasting solution to the "Cederberg Controversy". Visitors who prefer even more developed recreation opportunities are likely to be attracted to the area, compounding the demand for development. The process of "displacement and succession" is therefore likely to be accelerated. In addition, the "wilderness versus more intensive recreation development" conflict is likely to be intensified. Ultimately, gradual development of recreation opportunities in the area may lead to the acceptance of lowest common denominator recreation conditions (Glavovic in press). Paradoxically there may be a point at which accommodating changing demands, by modifying recreation opportunities, constitutes a social welfare loss.

Before further consideration is given to the application of the ROS concept to recreation planning in South Africa, attention needs to be given to reconciling the problem of meeting visitor demands and the problem of maintaining diverse recreation opportunities.

CHAPTER SEVEN: AN EXTENSION TO THE RECREATION OPPORTUNITY SPECTRUM CONCEPT

7.1 Introduction

The negative impacts of the "displacement and succession" process have been explicitly recognised in the ROS literature (Clark & Stankey 1979[a]:preface; Dustin et al 1982:51-53; Jubenville et al 1983:310-316). The potentially irreconcilable conflict between catering for visitor demands and maintaining diverse recreation opportunities has however, not been adequately addressed.

7.2 Demand, Diversity and the Recreation Opportunity Spectrum Concept

Dustin et al (1982:51-53) argue that planners and managers inadvertently accelerate the decline of quality recreation opportunities and environments by basing decisions on historic visitor preferences. Visitors select the stimuli to which they will respond (Schreyer et al 1985:16) and expectations can therefore be adjusted to conform to adverse conditions. In addition, visitors who are sensitive to deteriorating opportunities will be displaced by others who are more tolerant of such changes. Dustin et al (1982:54-57) suggest that the ROS concept provides a solution to the inadvertent decline of quality recreation opportunities. These writers however, incorrectly assert that the ROS concept replaces visitor satisfaction as the prime objective, with a commitment to stewardship of a diverse system of recreational environments. In the ROS literature, diversity is only seen to be a means to an end. Quality recreation, producing desired satisfactions and benefits, is considered to be the prime planning objective (Driver & Brown 1978:29; Clark & Stankey 1979[a]:5).

van Oosterzee (1984:99-101) points out that the ROS concept has a substantial anthropocentric bias: opportunities are a function of visitor preferences; and the recreation resource is seen merely as a supplier of opportunities, to be altered in response to changing demands. This "anachronistic consumer ethic" fosters the process of environmental transformation (see Section 3.3.2.1). The ROS concept is thus said to be an inappropriate justification for preserving the natural environment and an unsuitable basis for managing recreation in areas such as national parks. van Oosterzee is therefore critical of writers, such as Turner (1982 cited in van Oosterzee 1984:101), who claim that the ROS concept provides a conceptual basis for resolving the preservation versus use, or "wilderness versus more intensive development" conflict.

Ironically, restricting the use of the ROS concept to more developed recreation opportunities, as implied by van Oosterzee, may accentuate the "wilderness versus more intensive development" conflict. Viewing recreation opportunities in isolation may result in the adoption of a single-site planning approach, which has inherent disadvantages (see Sections 4.3 and 4.4). The limitations of planning on the basis of demand should therefore be addressed without abandoning an approach that considers the full range of recreation opportunities and integrates recreation and non-recreation values. More especially, it is necessary to reconcile the need to satisfy visitor demands with the need to maintain diverse recreation opportunities.

Manning (1985[b]:393-396) argues in favour of a liberal interpretation of the ROS concept, particularly with regard to the acceptability of combinations of setting attributes. Manning posits that a rigid interpretation, as suggested by some authors (e.g. Buist et al 1982:84), does not provide for unconventional opportunities (e.g. including apparently inconsistent attribute levels, such as a natural environment supporting relatively high density development and high

levels of use). Since there is a demand for such recreation opportunities, Manning suggests that a liberal interpretation of the ROS concept will expand the diversity of available opportunities, and best cater for visitor demands. Paradoxically, this suggestion may accelerate a decline in the diversity of recreation opportunities. Manning implicitly assumes that there will be sufficient and equitable distribution of opportunities for all visitor types. Cognisance has however, not been given to the situation where demand exceeds the supply of opportunities. The effect of adjusting the supply of opportunities, in response to visitor demands, on the diversity of available opportunities, is depicted in Figure 18.

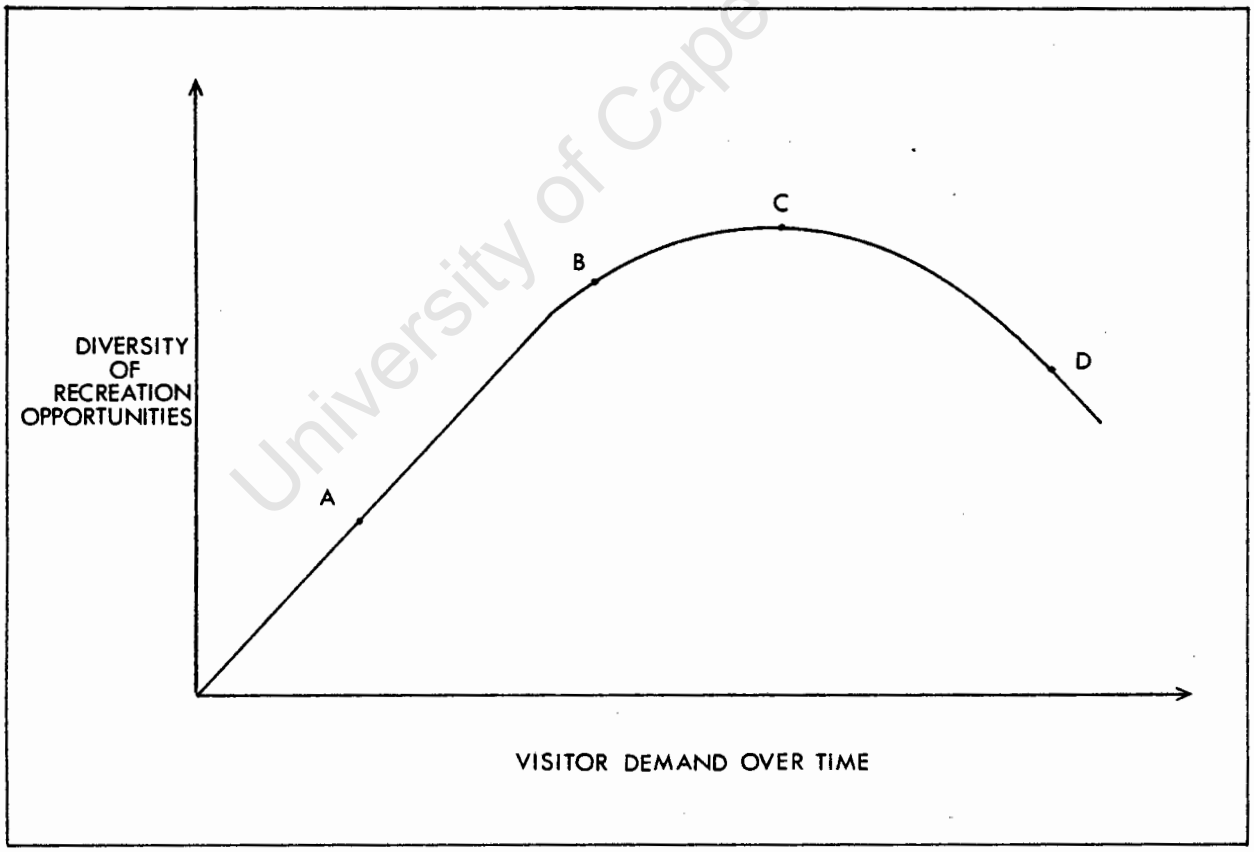


FIGURE 18: THE IMPACT OF ADJUSTING THE SUPPLY OF RECREATION OPPORTUNITIES, IN RESPONSE TO VISITOR DEMANDS, ON THE DIVERSITY OF AVAILABLE OPPORTUNITIES

Initially (e.g. at A), by adjusting the supply of opportunities to cater for visitor demands within a given region, the diversity of recreation opportunities will increase. As visitor demands become known, provision can be made for hikers, campers, bungalow visitors, and others, by converting recreation and non-recreation resources into a full spectrum of recreation opportunities. The slope of the function at this stage is dependent on the mix of preferences and needs, and therefore, may not be linear.

At B, the available recreation resource base in a region becomes limited. Levels of use approach the capacity of available opportunities. Adjusting supply to accommodate additional or new demands, will have to be traded off against existing opportunities. Diversity will still increase, but at a decreasing rate. In catering for these new demands some visitors may be displaced, but they should be able to find acceptable substitute opportunities in the region. In order to accommodate additional bungalow visitors in one area, for example, the supply of camping opportunities may need to be reduced in that area. By developing some existing primitive opportunities elsewhere in the region, the demands of campers can be met, and hikers may still be able to obtain satisfying experiences in remaining primitive areas within the region.

At C, the capacity of the recreation resource base to supply opportunities is matched by visitor demands. Adjusting the supply of opportunities to accommodate an increase in demand for any given opportunity (e.g. at D) necessitates a conversion of existing opportunities. The result will be a loss of diversity, and some visitors may be permanently displaced, because the conversion tends to be asymmetric, from less developed to more developed opportunities.

Recreation opportunities at the less developed end of the spectrum, such as wilderness, exhibit common property resource characteristics and provide quasi-public good

benefits (see Sections 2.2.1 and 2.3.1). When demand exceeds the supply of such a resource, and visitors have independent rights to use the resource, basing decisions on visitor demands will result in congestion. External effects will favour recruitment to externality-imposing visitors. With time, there will be a de facto monopoly of the resource by the visitors generating the largest negative externality (Baden 1977[b]:244). For example, visitors such as hikers are likely to be displaced by visitors who demand additional facilities, and who can tolerate crowding and environmental degradation. Therefore, by basing supply decisions on visitor demands, there will be a tendency towards increasing homogeneity and a decline in the quality of recreation opportunities and environmental conditions.

It has long been recognised that recreation planning decisions, based on public attitudes about solitude, and pristine or natural conditions, tend to become less discriminating as population rises, urban densities increase, and pressure grows to divert demand to more primitive recreation opportunities (see e.g. Adams 1930; Leopold 1934; Wagar 1946). But at the same time, outdoor recreation amenities are considered to be "superior goods", i.e. the demand for such amenities increases disproportionately with increases in income (Baden 1977[b]:243). Empirical evidence indicates that as income rises, the demand for outdoor recreation, and particularly for more primitive opportunities, will grow. In the United States, the growth in wilderness use has exceeded the general increase in demand for outdoor recreation (Hendee, Stankey & Lucas 1978:307-309; Hendee & Roggenbuck 1984). Similar patterns may be developing in South Africa (Andrag 1983:358).

Wilderness is however, a rapidly diminishing resource, due to the pervasive process of environmental transformation (see Section 3.2). Even reclassifying resources from de facto to de jure wilderness does little to add new opportunities,

because de facto wilderness areas are already being used for wilderness recreation (Stankey 1972:89). Moreover, for all practical purposes, wilderness represents an irreproducible resource that provides non-substitutable benefits to recreation and non-recreation users. Given the asymmetric implications of environmental modification, wilderness should be regarded as an irreplaceable asset of appreciating value. The loss of wilderness therefore reduces meaningful choice and constitutes a permanent social welfare loss (see Section 3.7.2).

Proponents of the ROS concept recognise that protecting the diversity of recreation opportunities is necessary to ensure that most people will be able to find quality opportunities now and in the future (see Section 5.3.1). Neither the proponents of the ROS concept nor its critics have however, provided an adequate solution to the conflict between catering for visitor demands and maintaining diverse recreation opportunities.

Paradoxically, in order to create an environment that promotes self-satisfaction and happiness, there is a point at which it becomes necessary to base decisions on prescription rather than on preferences. Recreation planners are reluctant to prescribe because visitor preferences have traditionally been the basis of planning decisions (see Chapter 4). Fundamental principles of democracy and welfare economics emphasise the rights and sovereignty of the individual or consumer. It is nonetheless widely accepted that individual preferences are not always an appropriate guide for making decisions that are in the public interest (see Section 3.3.2.2) (see e.g. Hayek 1977; Wootton 1977 on these issues in the context of planning). Individuals are limited by poor information, a lack of foresight, and a strong bias towards personal gratification. Individuals may have relatively little interest about the maximisation of social welfare. This may lead to actions which are not optimal for society,

which has a collective commitment to life in perpetuity (Krutilla et al 1975:61). Therefore, it may be necessary to compel individuals to exercise their preferences in a manner that enhances social well-being.

7.3 The Limits of Acceptable Change System and the Concept of Non-Degradation

Given that the need may arise to prescribe to visitors, the question remains of "How much prescription is necessary?" The recently developed LAC system (see Section 5.5) has drawn some attention to this question. The LAC system facilitates definition of "acceptable" recreation conditions, and identifies actions to protect or achieve these conditions. In addition, the concept of non-degradation is introduced (Stankey, Cole, Lucas, Petersen & Frissell 1985:15).

The concept of non-degradation calls for maintenance of present resource conditions if they equal or exceed minimum standards for an area, and for the restoration of conditions that are below-minimum standards. Focussing specifically on wilderness areas, writers on the LAC system emphasise that heavily impacted areas should not serve as the basis for setting minimum acceptable standards. Moreover, with rigorous application of the non-degradation concept, current conditions may establish a base below which standards should not be allowed to fall. When conditions approach such standards, additional demands simply cannot be accommodated. Although the application of this concept would prevent an irreversible decline in the quality of the wilderness experience, it would accelerate the imposition of more stringent management restrictions. In addition, opportunity costs imposed on managers and visitors could be unacceptably high. The LAC system is said to facilitate the calculation of costs and benefits of alternatives, and to identify what actions will be needed to accomplish management objectives (Stankey, Cole, Lucas, Petersen & Frissell 1985:16).

Although the LAC system was initially developed for planning primitive recreation opportunities, it is considered to be applicable to other settings (Stankey & McCool 1984:467). The concept of non-degradation could not however, be effectively applied to all recreation opportunities. Rigorous application of the concept across all opportunities would result in total inflexibility. Unacceptable opportunity costs would therefore be imposed on planners, managers and visitors. In particular, the application of the concept to recreation opportunities that are privately owned is not likely to be realised. In such cases, the nature of opportunity offered will be influenced primarily by a profit motive. The demands of visitors will consequently weigh heavily in planning decisions. Standards may therefore have to be altered in accord with changing visitor demands.

7.4 The Pre-eminence of Maintaining Diversity Relative to Catering for Visitor Demand

The fundamental issue facing recreation planners remains the determination of an appropriate balance between more and less developed opportunities. To address this issue it is recommended that the primary goal of the ROS concept, namely producing desired visitor satisfactions and benefits, should be supplemented with a commitment to maintaining diverse recreation opportunities. This expanded goal should also be adopted for the LAC system which provides a framework for more area-specific recreation planning.

To achieve this new goal, recreation planners need to distinguish between decisions which have reversible consequences (i.e. opportunity costs are ephemeral and inconsequential), and those in which consequences are irreversible (i.e. opportunity costs are permanent and significant).

Where decisions affecting the supply of opportunities are reversible, as is generally the case in the city setting, the planning process should be guided primarily by visitor demands. (A decision resulting in the loss of an historic building or structure, for example, is an obvious exception.) In this way, flexibility can be maintained to accommodate changes in demand that arise from altered social or technological circumstances. Planners also have the option of reverting back to the original opportunity. Visitors may be displaced in the process of adjusting the supply of opportunities, but the potential substitutability of such opportunities is likely to be relatively high (Stankey 1972:94). Visitors are therefore not likely to be permanently displaced. The desired balance between various recreation opportunities created by man is consequently determined by the interaction of visitor demands and the relative substitutability of alternative opportunities.

Where decisions affecting the supply of opportunities are irreversible, as is often the case within a wilderness setting, the maintenance of diversity should take precedence over visitor demands. Wilderness is a resource which can shrink but cannot grow (Leopold 1966:278). An increase in demand for wilderness recreation therefore cannot be met by an increase in supply. The loss of wilderness thus constitutes a permanent opportunity cost. In an uncertain and changing environment, there is value in retaining options that would otherwise be foreclosed (see Section 3.7.3). It is therefore proposed that the concept of non-degradation be rigorously applied to the wilderness setting. In this case, prescription will be necessary to ensure an ample supply of recreation opportunities at the less developed end of the spectrum. Substantial opportunity costs will be incurred in keeping future options open, and this prescription may be regarded as inefficient. But the long-term opportunity cost of retaining wilderness may not be very high, given the asymmetric implications of technology and the risks

associated with environmental disruption (see Section 3.7.2).

The question of: "How many wilderness areas do we need?" remains. In reply to this question, Bob Marshall, an early advocate of wilderness preservation at virtually any opportunity cost, replied: "How many Brahms's symphonies do we need?" (Nash 1976:30). There is no objective answer to these value-laden questions.

> One may accept the desirability of increasing the opportunities for individual choice (itself a value judgement), while maintaining that a series of social judgments is necessary to define the limits of individual freedom in accordance with the criterion of what is good for mankind in general, or for society as a co-operative enterprise; and recognising as a corollary of this proposition the implicit involvement of social value questions whenever there is the possibility of change in the conditions that define what can be done.
>
> The difficulty, of course, is that, of all social processes, the most mysterious and the least subject to guidance are those by which value standards are formed and changed (Barnett et al 1965:593-594).

Though there are divergent views regarding the roles of values and institutions as determinants of behaviour, and hence change, it would seem that values influence institutions, but institutions also influence values (Barbour 1980:100-101). The question arises of: "How can the extended ROS concept be effectively incorporated into the planning system in South Africa?"

7.5 Incorporating the Extended Recreation Opportunity Spectrum Concept into the Planning System in South Africa

Mechanisms whereby the extended ROS concept can be incorporated into the planning system in South Africa is a research topic in its own right. A few observations will be made to provide a starting point towards this end.

In South Africa, land-use planning is primarily the task of the government. A three-tier government structure, comprising national, provincial and local levels, is currently employed (see e.g. Malan, Rabie & Fuggle 1983; Page et al 1983). In recent years, an effort has been made to devolve executive functions to the lower tiers of government. Planning at the national level of government is thus primarily policy-oriented. It is submitted that the principle of an integrated environmental continuum should be adopted as a matter of policy: as an ideal towards which planners at all levels should strive. This principle provides a basis for planning recreation in the context of environmental transformation. The formulation of policy, and guidelines, that specifically address recreation, should incorporate the expanded goal of the ROS concept. In addition, the need to give precedence to diversity rather than demand, in cases where the consequences of a decision are irreversible and significant, should be clearly articulated.

Land-use planning at the provincial and local levels of government is now largely conducted by means of the Structure Planning process. In the Cape Province, for example, the Land-use Planning Ordinance (No.15 of 1986) and the associated Manual for Structure Planning (CPA 1986) provide the basis for this process. The general purpose of a structure plan is to lay down guidelines for future spatial development of an area in such a way as to effectively promote the order of an area, and improve the general welfare of the community concerned (CPA 1986:1). In effect, structure plans are policy plans and control land-use only in an indirect way (Claassen 1986:23). Nonetheless, they will provide the basis for determining future land-use from the regional to the local scale.

Structure planning can be conducted at a number of different scales. The sub-regional scale of structure planning in particular appears to have considerable potential for

effective implementation of the extended ROS concept. Sub-regional structure plans:

(1) Focus on the investigation of specific elements, such as recreation, in the context of other land-use opportunities.
(2) Indicate conceptually, the form that future development will take, or how problems will be solved.
(3) Can be prepared at the regional or sub-regional scale, and need not adhere strictly to local authority boundaries.
(4) Are instruments for co-ordinating the actions of public authorities who control land-use, and for encouraging effective public participation.
(5) Provide long-term guidelines (i.e. for 15-25 years) which should be reviewed every 10 years (CPA 1986:7-9).

Further research will be needed to determine the most effective means of incorporating the extended ROS concept into the Structure Planning process and other planning mechanisms in South Africa. Ultimately, it is the attitudes and values of planners and the public, rather than legislation or planning procedures, that will determine the extent to which the goal of the extended ROS concept will be achieved.

CHAPTER EIGHT: CONCLUSION

8.1 The Challenge Facing Recreation Planners in South Africa

A major challenge facing recreation planners in South Africa is to maintain a full spectrum of recreation opportunities, despite growing direct and indirect pressures to develop certain opportunities at the expense of others. Past recreation use in the Cederberg, and the more recent "Cederberg Controversy", demonstrate the urgent need for a recreation planning framework to meet this challenge.

Traditional recreation planning approaches have exacerbated the modification of recreation opportunities in natural areas. A relentless process of visitor displacement and succession has been stimulated, whereby external effects favour recruitment to externality-imposing uses. There is growing disparity between recreation opportunities in more and less developed environments. Conflicts between recreation uses, and between recreation and other land-use practices, have become prevalent and intense. In attempting to cater for visitor demands, planners have inadvertently accelerated the decline in quality recreation opportunities. The resultant spread of lowest common denominator recreation conditions constitutes a reduction in social welfare.

8.2 A Proposed Framework

To manage recreation resources effectively, recreation needs to be part of a comprehensive land-use planning approach. The process of environmental transformation has resulted in a proliferation of negative impacts, and a growing risk of widespread environmental disruption. Planners face a dilemma of meeting the immediate needs and wants of increasing numbers of people, while maintaining diverse environmental conditions to cater for man's basic needs and for sustaining

social progress. In view of the uncertainty of the full consequences of continued, rapid environmental change, and the likelihood of a growing incidence of irreversible changes, planners and decision-makers should strive to maintain a diversity of conditions from wilderness to the truly urban city. It is proposed that protecting, developing and restoring an integrated environmental continuum provides a fundamental goal for land-use planning.

The ROS concept, supplemented by the LAC system, provides a general framework that enables recreation planners to take into account direct and indirect pressures on recreation opportunities. The underlying rationale of this framework complements the goal of maintaining an integrated environmental continuum. To provide planners in South Africa with data based on principles of the ROS concept, a survey was done of visitor attitudes about the appropriate future recreation use of the Cederberg. By making diversity an adjunct to the goal of visitor satisfaction, it emerged that the ROS concept cannot always satisfactorily reconcile the problem of meeting visitor demand and the problem of maintaining diverse recreation opportunities.

The major conclusion of this report is that in certain cases the goal of visitor satisfaction should be subservient to a commitment to maintain diverse recreation opportunities. Specifically, the maintenance of diverse recreation opportunities should take precedence over visitor demands whenever the consequences of a decision affecting the supply of opportunities are irreversible. Planners and decision-makers should accept that when catering for demand threatens to reduce diversity, through a reduction of irreplaceable resources with no close substitutes, prescription becomes necessary to prevent permanent opportunity costs being imposed on society. It is suggested that this extended ROS concept provides a framework for addressing the challenge facing recreation planners in South Africa.

BIBLIOGRAPHY

A' Bear, D.R. & Little, A.M. 1976. Techniques in Evaluating Natural Resources for Recreation, in Proceedings of the First Conference on Recreation Research, Department of Nature Conservation, Faculty of Forestry, University of Stellenbosch, 119-136.

Abbey, E. 1971. Desert Solitaire: A Season in the Wilderness, New York: Ballantine Books, Inc., 303p.

Altman, I. 1975. The Environment and Social Behavior, Monterey, California: Brooks/Cole Publishing Company, 256p.

Ackerman, D.P. 1972. The Proclamation of Wilderness Areas by the Department of Forestry. South African Forestry Journal, no.82, 19-21.

Ackerman, D.P. 1979. The Reservation of Wilderness Areas in South Africa. South African Forestry Journal, no.108, 2-4.

Adams, J.T. 1930. Diminishing Returns in Modern Life. Harpers, V.160, 529-537.

Anderson, D.H. & Brown, P.J. 1984. The Displacement Process in Recreation. Journal of Leisure Research, V.16, no.1, 61-73.

Andrag, R.H. 1977. Studies in die Sederberge oor (i) Die status van die Clanwilliam-seder (Widderingtonia Cedarbergensis Marsh) (ii) Buitelugontspanning. Unpublished MSc thesis, University of Stellenbosch, South Africa, 142p.

Andrag, R.H. 1979. A Review of Recreation on State Forests in South Africa, in Proceedings of the International Symposium on Research in Sport and Recreation, Stellenbosch: The South African Sports Federation, Department of Sport and Recreation, University of Stellenbosch, 1-9.

Andrag, R.H. 1983. Recreation on Forest Reserves. South African Forestry Handbook, edited by P.B. Odendaal, D.L. Owen, D.L. Bosman, A.P.G. Schonan, K. von Gadow & D.W. van der Zel. Published by the South African Institute of Forestry, 358-362.

Anon. undated. Opening van die Sederberg-Wilderness gebied te Algeriee op 27 Julie 1973, 11p.

Anon. 1936. The Motor-car in Mountaineering. The Journal of the Mountain Club of South Africa, no.38, 7-8.

Anon. 1975. Wilderness Management and the Multiple-use Mandate. Environment Law Review, V.6, 509-542.

Arrow, K.J. & Fisher, A.C. 1974. Environmental Preservation, Uncertainty and Irreversibility. Quarterly Journal of Economics, V.LXXXVIII, no.2, 312-319.

Ashor, J.L., McCool, S.F. & Stokes, G.L. 1986. Improving Wilderness Planning Efforts: Application of the Transactive Planning Approach, in Proceedings of the National Wilderness Research Conference:Current Research, USDA, FS General Technical Report INT-212, Ogden, Utah: Intermountain Forest and Range Experiment Station, 424-431.

Babbie, E.R. 1973. Survey Research Methods, edited by Ellen Seacat, Belmont, California: Wadsworth Publishing Co., Inc., 384p.

Baden, J. 1977[a]. A Primer for the Management of Common Pool Resources, in Managing the Commons, edited by G. Hardin and J. Baden, San Francisco: W.H. Freeman, 137-146.

Baden, J. 1977[b]. Neospartan Hedonists, Adult Toy Aficionados, and the Rationing of Public Lands, in Managing the Commons, edited by G. Hardin and J. Baden, San Francisco: W.H. Freeman, 241-251.

Baier, K. 1969. What is Value? An Analysis of the Concept, in Values and the Future, edited by K. Baier and N. Rescher, New York: Free Press, 33-67.

Bands, D.P. undated. Policy Memorandum - Cederberg Catchment Area No.1 - Management Plan for the Period 1979/80 - 1983/84. Department of Forestry, Stellenbosch, South Africa, 161p.

Barbour, I.G. 1980. Technology, Environment, and Human Values, New York: Praeger, 331p.

Barnett, H.J. & Morse, C. 1965. Natural Resources and the Quality of Life, in Readings in Resource Management and Conservation, edited by I. Burton and R.W. Kates, Chicago: University of Chicago Press, 585-594.

Becker, R.H. 1981. Displacement of Recreational Users Between the Lower St. Croix and Upper Mississippi Rivers. Journal of Environmental Management, V.13, no.3, 259-267.

Bentham, C.G. & Moseley, M.J. 1982. Social Surveys, in Environmental Science Methods, edited by R. Haynes, London: Chapman and Hall Ltd., 348-371.

Berrisford, A.B. 1947. Further Exploration in the Cedarberg. Breek-Krans Ridge. Journal of the Mountain Club of South Africa, no.50, 52-62.

Bishop, R.C. 1978. Endangered Species and Uncertainty: The Economics of a Safe Minimum Standard. American Journal of Agricultural Economics, V.60, no.1, 10-18.

Bishop, R.C. 1982. Option Value: An Exposition and Extension. Land Economics, V.58, no.1, 1-15.

Blake, G.P. 1982. An Evaluation of Conjoint Analysis and Multidimensional Scaling as Descriptive Techniques for Multiattribute Decision Analysis. Unpublished MBA thesis, University of Cape Town, South Africa, 246p.

Bonnicksen, T.M. 1983. The National Park Service and Local Communities: A Problem Analysis. Western Wildlands, V.9, no.2, 11-13.

Botkin, D.B. 1984. The Garden of the Unicorn - the Ecosystem Context for the Management of Endangered Species, in Conservation of Threatened Natural Habitats, edited by A.V. Hall, South African National Scientific Programmes Report No.92, Pretoria: CSIR, 66-81.

Bratton, S.P. 1986. Battling Satin in the Wilderness: Antagonism, Spirituality and Wild Nature in the Four Gospels, in Proceedings of the National Wilderness Research Conference: Current Research, USDA, FS General Technical Report INT-212, Ogden, Utah: Intermountain Forest and Range Experiment Station, 406-411.

Bristow, D. 1985. Mountains of Southern Africa, edited by Leni Martin, Cape Town: C. Struik (Pty) Ltd., 144p.

Brockman, C.F. & Merriam, L.C. 1979. Recreational Use of Wild Lands, Third Edition, United States: McGraw-Hill Book Co., 337p.

Brown, P.J. 1977. Whitewater Rivers: Social Inputs to Carrying Capacity Based Decisions in, Proceedings of the Symposium on Managing Colorado River Whitewater: The Carrying Capacity Strategy, edited by L. Roger, W.H. Becker & R. Schreyer, Logan, Utah: Institute for the Study of Outdoor Recreation and Tourism, 92-111.

Brown, P.J. 1981. Psychological Benefits of Outdoor Recreation, in Social Benefits of Outdoor Recreation, edited by J.R. Kelley, Champaign, Illinois: Leisure Behavior Research Laboratory, University of Illinois, 13-17.

Brown, T.C. 1984. The Concept of Value in Resource Allocation. Land Economics, V.60, no.3, 231-246.

Brown, P.J., Driver, B.L. & Berry, J.K. 1980. Use of the Recreation Opportunity Planning System to Inventory Recreation Opportunities on Arid Lands, in Arid Land Resource Inventories: Developing Cost Efficient Methods, General Technical Report WO-28, Washington DC: USDA, FS, 123-128.

Brown, P.J., Driver, B.L., Bruns, D.H. & McConnell, C. 1979. The Outdoor Recreation Opportunity Spectrum in Wildland Recreation Planning: Development and Application, in First Annual National Conference on Recreation Planning and Development: Proceedings of the Specialty Conference, New York: American Society of Civil Engineers, V.2, 527-538.

Brown, P.J., Driver, B.L. & McConnell, C. 1978. The Opportunity Spectrum Concept and Behavioral Information in Outdoor Recreation Supply Inventories: Background and Application, in Proceedings of the Integrated Inventories of Renewable Natural Resources Workshop, USDA, FS General Technical Report RM-55, Fort Collins, Colorado: Rocky Mountain Forest and Range Experiment Station, 73-84.

Brown, G. & Goldstein, J.H. 1984. A Model for Valuing Endangered Species. Journal of Environmental Economics and Management, V.11, no.4, 303-309.

Brown, P.J. & Haas, G.E. 1980. Wilderness Recreation Experience: The Rawah Case. Journal of Leisure Research, V.12, no.3, 229-241.

Brown, L.R., McGrath, P.L. & Stokes, B. 1976. Twenty-Two Dimensions of the Population Problem. Worldwatch, Paper 5, 83p.

Bryan, H. 1979. Conflict in the Great Outdoors: Toward Understanding and Managing for Diverse Sportsmen Preferences. Sociological Studies No.4, University of Alabama, Alabama: The Birmingham Publishing Company, 98p.

Buchanan, T. & Buchanan, J.P. 1981. Some Initial Observations on Conflict Research. Recreation Research Review, July, 36-42.

Buist, L.J. & Hoots, T.A. 1982. Recreation Opportunity Spectrum Approach to Resource Planning. Journal of Forestry, V.80, no.2, 84-86.

Buiten, J.H. 1976. A Theoretical Framework for the Use of Parameters in the Recreational Planning Process, in Proceedings of the First Conference on Recreation Research, Stellenbosch, Department of Nature Conservation, Faculty of Forestry, University of Stellenbosch, 100-113.

Cameron, K. 1922. The Cedar Mountains of Clanwilliam. The Annual of the Mountain Club of South Africa, no.25, 84-105.

Cameron, K. 1924. The Cedar Mountains of Clanwilliam. A Second Visit. The Annual of the Mountain Club of South Africa, no.27, 20-33.

Cameron, K. 1936. Pakhuis Peaks. Northern Cedar Mountains. Journal of the Mountain Club of South Africa, no.39, 26-31.

Canadian Land Inventory 1969. Land Capability Classification for Outdoor Recreation. Report No.6, Ottawa: Department of Regional Economic Expansion.

Cape Provincial Administration 1973. Cape Coast Recreational Land-use Classification. Unpublished Document. Cape Provincial Administration, Cape Town.

Cape Provincial Administration 1986. Manual for Structure Planning. Cape Town: Provincial Administration, 50p.

Carhart, A.H. 1961. Planning for America's Wildlands: A Handbook for Land Use Planners, Committee and Commission Members, Conservation Leaders and All Who Face Problems of Wildland Management, Harrisburg, Pennsylvania: National Audubon Society, 97p.

Carlson, A. 1984. Nature and Positive Aesthetics. Environmental Ethics, V.6, no.1, 5-34.

Cartwright, T.J. 1977. Problems, Solutions and Strategies: A Contribution to the Theory and Practice of Planning, in Planning for Social Welfare, edited by N. Gilbert and H. Specht, New Jersey: Prentice-Hall, 119-132.

Cattin, P. & Wittnik, D.R. 1982. Commercial use of Conjoint Analysis: A Survey. Journal of Marketing, V.46, 44-53.

Chilman, K.C. 1983. Developing an Information Gathering System for Large Land Areas, in Recreation Planning and Management, edited by S.R. Lieber and D.R. Fesenmaier, London: E. & F.N. Spon Limited, 203-215.

Choi, S., Mirjafari, A. & Weaver, H. 1976. The Concept of Crowding: A Critical Review and Proposal of an Alternative Approach. Environment and Behavior, V.8, no.3, 345-364.

Churchill, G.A. 1983. Marketing Research - Methodological Foundations, Chicago: Dryden, 756p.

Cicchetti, C.J. & Freeman, A.M. 1971. Option Demand and Consumer Surplus: Further Comment. Quarterly Journal of Economics, V.LXXXV, no.3, 528-539.

Claassen, P. 1986. Structure Plans: A Theoretical Approach. Paper read at the Annual Conference of the South African Institute of Town and Regional Planners (Cape Branch), University of Cape Town, South Africa, 19-26.

Clark, R.N. 1982. Promises and Pitfalls of the Recreation Opportunity Spectrum in Resource Management. Australian Parks and Recreation, May, 9-13.

Clark, R.N., Hendee, J.C. & Campbell, F.L. 1971. Values, Behaviors, and Conflict in Modern Camping Culture. Journal of Leisure Research, V.3, no.3, 143-159.

Clark, R.N. & Stankey, G.H. 1979[a]. The Recreation Opportunity Spectrum: A Framework for Planning, Management and Research. USDA, FS General Technical Report PNW-17, Oregon: Pacific Northwest Forest and Range Experiment Station, 32p.

Clark, R.N. & Stankey, G.H. 1979[b]. Determining the Acceptability of Recreational Impacts: An Application of the Outdoor Recreation Opportunity Spectrum, in Proceedings of Recreational Impact on Wildlands Conference, Washington: USDA, FS Miscellaneous Publication, 32-42.

Clark, R.N. & Stankey, G.H. 1986. Site Attributes - A Key to Managing Wilderness and Dispersed Recreation, in Proceedings of the National Wilderness Research Conference: Current Research, USDA, FS General Technical Report INT-212, Ogden, Utah: Intermountain Forest and Range Experiment Station, 509-515.

Clawson, M. 1963. Land and Water for Recreation: Opportunities, Problems and Policies, Chicago: Rand McNally and Co.

Clawson, M. & Knetsch, J.L. 1966. Economics of Outdoor Recreation, Baltimore: John Hopkins Press, 328p.

Collins, R. & Hodge, J. 1984. Clustering Visitors for Recreation Management. Journal of Environmental Management, V.19, 147-158.

Cooper, C. 1981. Economic Evaluation and the Environment, London: Hodder & Stoughton, 161p.

Coppock, J.T. & Duffield, B.S. 1975. Recreation in the Countryside: A Spatial Analysis, London: McMillan, 262p.

Cordell, H.K. & Hendee, J.C. 1982. Renewable Resources Recreation in the United States: Supply, Demand and Critical Policy Issues, Washington D.C.: American Forestry Association, 88p.

Cosper, R. 1982. Dimensions of Cultural Interest: An Analysis of the Data from the 1978 Canadians and the Arts Survey, Ottawa: Department of Communications

Cosper, R. & Kinsley, B.L. 1984. An Application of Conjoint Analysis to Leisure Research: Cultural Preferences in Canada. Journal of Leisure Research, V.16, no.3, 224-233.

Council for the Environment 1984. Proposed Take-Over by the National Parks Board of the Cederberg Wilderness Area and the Adjacent State Land. Report and Recommendations to the Honourable Minister of Environment Affairs and Tourism, 6p.

Crowe, S. 1974. The Master Plan for National Parks and Their Regional Setting, in Second World Conference on National Parks, edited by Sir H. Elliot, Switzerland: IUCN, 161-172.

Dasgupta, P.S. 1982[a]. Environmental Management Under Uncertainty, in Explorations in Natural Resource Economics, edited by V.K. Smith and J.V. Krutilla, Baltimore: John Hopkins Press, 109-139.

Dasgupta, P.S. 1982[b]. The Control of Resources, Oxford: Blackwell, 223p.

Dasmann, R.F. 1984. Environmental Conservation, Fifth Edition, New York: John Wiley and Sons, 486p.

Dauvellier, P.L. (ed) 1977. Summary Ecological Model, National Physical Planning Agency, Ministry of Housing and Physical Planning, The Hague, 42p.

Department of Environment Affairs. 1986. Internal Memorandum. On File P4/1, dated 1986-06-20.

Department of Environmental Planning and Energy. 1980. National Outdoor Recreation Plan Terrain Capability Classification Volume 3 SATI, South Africa: Department of Environmental Planning and Energy, 82p.

Department of Planning and the Environment 1978. National Outdoor Recreation Plan Volume 1 Research Strategy: Methods and Techniques, South Africa: Department of Planning and the Environment, 14p.

Devall, B. & Sessions, G. 1985. Deep Ecology, Layton: Gibbs M. Smith, Inc., 266p.

Dix, G. 1984. Ekistics, Ecumenopolis and the Wilderness: Planning for a Global Ecological Balance, in Wilderness the Way Ahead, edited by V. Martin and M. Inglis, Forres: The Findhorn Press/Middleton: Lorian Press, 125-141.

Dohan, M.R. 1977. Economic Values and Natural Ecosystems, in Ecosystem Modelling in Theory and Practice: An Introduction with Case Histories, edited by C.A.S. Hall and J.W. Day (Jr), New York: John Wiley and Sons, 134-171.

Dorfman, R. & Dorfman, N. 1972. Economics of the Environment, New York: W.W. Norton & Company, 426p.

Downey, G. 1974. The Ethical City, the Secular City, and the City of God. Anglican Theological Review, V.56, no.1, 34-41.

Driver, B.L. 1975. Quantification of Outdoor Recreationist's Preferences, in Research Camping and Environmental Education, Pennsylvania State: HPER Service, 165-187.

Driver, B.L. 1976. Toward a Better Understanding of the Social Benefits of Outdoor Recreation Participation, in Proceedings of the Southern States Recreation Research Applications Workshop, USDA, FS General Technical Report SE-9, North Carolina: Southeastern Forest and Range Experiment Station, 163-189.

Driver, B.L. & Brown, P.J. 1975. A Social-Psychological Definition of Recreation Demand, with Implications for Recreation Resource Planning, in USDI Bureau of Outdoor Recreation, Assessing Demand for Outdoor Recreation, Washington D.C.: United States Government Printing Office, 64-88.

Driver, B.L. & Brown, P.J. 1978. The Opportunity Spectrum Concept and Behavioral Information in Outdoor Recreation Resource Supply Inventories: A Rationale, in Proceedings of the Integrated Inventories of Renewable Natural Resources Workshop, USDA, FS General Technical Report RM-55, Colorado: Rocky Mountain Forest and Range Experiment Station, 24-31.

Driver, B.L. & Tocher, S.R. 1970. Toward a Behavioral Interpretation of Recreational Engagements, with Implications for Planning, in Elements of Outdoor Recreation Planning, edited by B.L. Driver, Ann Arbor: University of Michigan Press, 9-31.

Dubos, R. 1965. Man Adapting. New Haven: Yale University Press, 527p.

Dubos, R. 1972. A God Within. New York: Charles Scribner's Sons, 325p.

Dubos, R. 1980. The Wooing of Earth. New York: Charles Scribner's Sons, 183p.

Dustin, D.L. & McAvoy, L.H. 1982. The Decline and Fall of Quality Recreation Opportunities and Environments. Environmental Ethics, V.4, no.1, 49-56.

Ellis, G.F.R. 1984. The Dimensions of Poverty, in Proceedings of Second Carnegie Inquiry into Poverty and Development in Southern Africa, Carnegie Conference Paper No.4, Cape Town: South Africa Labour and Development Research Unit, 1-24.

Fabos, J.G. 1979. Planning the Total Landscape: A Guide to Intelligent Land-use. Boulder: Westview Press, 181p.

Farnworth, E.G., Tidrick, T.H., Jordan, C.F. & Smathers, W.M. 1981. The Value of Natural Ecosystems: An Economic and Ecological Framework. Environmental Conservation, V.8, no.4, 275-282.

Farnworth, E.G., Tidrick, T.H., Smathers, W.M. & Jordan, C.F. 1983. A Synthesis of Ecological and Economic Theory Toward More Complete Valuation of Tropical Moist Forests. International Journal of Environmental Studies, V.21, no.1, 11-28.

Field, E.S. 1934. A Week-end in the Cedarbergen. The Krakadouw Peaks from Bosch Kloof. Journal of the Mountain Club of South Africa, no.37, 59-67.

Field, D.R. 1976. Interchangeability of Parks with Other Leisure Settings, in Research in the Parks, Transaction of the National Park Centennial Symposium, National Park Service Symposium Service 1, 159-168.

Fisher, A.C. & Krutilla, J.V. 1974. Valuing Long Run Ecological Consequences and Irreversibilities. Journal of Environmental Economics and Management, V.1, 96-108.

Foin, T.C. 1976. Ecological Systems and the Environment. United Stated: Houghton Mifflin Co., 591p.

Foote, J.P. 1973. Wilderness - A Question of Purity. Environmental Law, V.3, 255-266.

Fox, I.K. 1970. The Nature of Planning Decisions in a Democratic Society, in Elements of Outdoor Recreation Planning, edited by B.L. Driver, Ann Arbour: University of Michigan Press, 213-224.

Friedmann, J. 1964. Cities in Social transformation, in Regional Development of Planning, edited by J. Friedmann and W. Alonso, Massachussets: MIT Press, 343-360.

Friedmann, J. 1977. The Transactive Style of Planning, in Planning for Social Welfare, edited by N. Gilbert and H. Specht, New Jersey: Prentice-Hall, 113-118.

Frissell, S.S. & Stankey, G.H. 1972. Wilderness Environmental Quality: Search for Social and Ecological Harmony, in Proceedings of the Society of American Foresters Annual Meeting, 170-183.

Fuggle, R.F. 1983. Population Growth and Resource Demands, in Environmental Concerns in South Africa, edited by R.F. Fuggle and M.A. Rabie, Cape Town: Juta & Co., Ltd., 23-29.

Fuller, R.B. 1970. Utopia or Oblivion: The Prospect for Humanity, London: Lane, 416p.

Gasson, B. 1987. Some Environmental Concerns in City Development, Town and Regional Planning Journal, Special Edition, 35-43.

Gilbert, N. & Specht, H. (ed) 1977. Planning for Social Welfare, New Jersey: Prentice-Hall, Inc., 398p.

Glavovic, B.C. (in press) Wilderness versus More Intensive Recreation Development: Perceptions of the Cederberg Controversy. Paper presented at Fourth World Wilderness Congress, Denver, Colorado.

Goodin, R.H. 1983. The Ethics of Destroying Irreplaceable Assets. International Journal of Environmental Studies, V.21, no.1, 55-66.

Gordon, H.S. 1954. The Economic Theory of a Common Property Resource: The Fishery. Journal of Political Economy, V.62, no.2, 124-142.

Goudie, A. 1986. The Human Impact on the Natural Environment. Oxford: Basil Blackwell, 338p.

Gould, E.M. 1961. Planning a Recreational Complex. American Forests, V.67, 30-35.

Goy, J. 1970. Krakadouw to Scorpionsberg. Journal of the Mountain Club of South Africa, no.73, 53-55.

Graber, L.H. 1976. Wilderness as Sacred Space. Washington D.C.: Association of American Geographers, 124p.

Grabow, S. & Heskin, A. 1973. Foundations for a Radical Concept of Planning. Journal of the American Institute of Planners, V.39, no.2, 106-114.

Gramman, J.H. 1982. Toward a Behavioral Theory of Crowding in Outdoor Recreation: An Evaluation and Synthesis of Research. Leisure Sciences, V.5, no.2, 109-121.

Gramman, J.H. & Burdge, R. 1981. The Effect of Recreation Goals on Conflict Perception: The Case of Water Skiiers and Fishermen. Journal of Leisure Research, V.13, no.1, 15-27.

Green, P.E. 1975. On the Design of Choice Experiments Involving Multifactor Alternatives. Journal of Consumer Research, V.1, 61-68.

Green, P.E. & Srinivasan, V. 1978. Conjoint Analysis in Consumer Research: Issues and Outlook. Journal of Consumer Research, V.5, 103-123.

Green, P.E. & Tull, D.S 1978. Research for Marketing Decisions. New Jersey: Prentice Hall, Inc.

Green, P.E. & Wind, Y. 1975. New Way to Measure Consumers' Judgments. Harvard Business Review, V.53, 107-117.

Grindley, J.R. 1976. Planning for Recreational Usage of Mountain Areas, in Conference Proceedings of Mountain Environments, Johannesburg: Council for the Habitat.

Gutman, H. 1967. The Biological Roots of Creativity, in Explorations in Creativity, edited by R. Mooney and T. Razik, New York: Harper and Row.

Gwatkin, D.R. & Brandel, S.K. 1982. Life Expectancy and Population Growth in the Third World. Scientific American, V.246, no.5, 33-41.

Haas, G., Driver, B.L. & Brown, P.J. 1980. A Study of Ski Touring Experiences on the White River National Forest, in Proceedings of the North American Symposium on Dispersed Winter Recreation, University of Minnesota, St. Paul, Minnesota, 25-30.

Haight, K. 1974. The Wilderness Act: Ten Years After. Environmental Affairs, V.3, 275-301.

Hall, A.V. 1978. Endangered Species in a Rising Tide of Human Population Growth. Transactions of the Royal Society of South Africa, V.43, 37-49.

Hall, A.V. & Rabie, M.A. 1983. Indigenous Plants, in Environmental Concerns in South Africa, edited by R.F. Fuggle and M.A. Rabie, Cape Town: Juta & Co., Ltd., 164-189.

Hallack, R. 1928. A Trip to the Cedarberg Mountains. The Annual of the Mountain Club of South Africa, no.31, 98-103.

Hammitt, W.E. 1980. Outdoor Recreation: Is it a Multi-Phase Experience? Journal of Leisure Research, V.12, no.2, 107-115.

Hammond, J.H. (Jr) 1970. The Wilderness Act and Mining: Some Proposals for Conservation. Environmental Law Review, V.1, 512-525.

Hanks, J. 1976. What is Conservation?. Salisbury: Department of Natural Resources, 16p.

Hardin, G. 1968. The Tragedy of the Commons. Science, V.162, 1243-1248.

Haughton, S.H. 1927. A Mountain and a Motor Car. Annual of the Mountain Club of South Africa, no.30, 91-98.

Hayek, F.A. 1977. Planning and Democracy, in Planning for Social Welfare, edited by N. Gilbert and H. Specht, New Jersey: Prentice-Hall Inc., 25-43.

Haynes, R.M. 1982. Statistics, in Environmental Science Methods, edited by R.M. Haynes, London: Chapman & Hall Ltd., 95-166.

Haynes, R.M., Harvey, J.G. & Davies, T.D. 1982. Measurement, in Environmental Science Methods, edited by R.M. Haynes, London: Chapman & Hall Ltd., 1-25.

Heberlein, T.A. 1977. Density, Crowding and Satisfaction: Sociological Studies for Determining Carrying Capacities, in Proceedings of River Recreation Research and Management Symposium, USDA, FS General Technical Report NC-28, St. Paul, Minnesota: North Central Forest and Range Experiment Station, 67-76.

Heberlein, T.A., Alfano, G., Shelby, B, & Vaske, J.J. 1979. Expectations, Preferences, and Feeling Crowded in Recreation Activities. Paper presented at the Annual Meeting of the Rural Sociological Society, Vermont, 32p.

Hendee, J.C. 1974. A Scientist's View on Some Current Wilderness Management Issues. Western Wildlands, V.1, no.2, 27-32.

Hendee, J.C. & Burdge, R.J. 1974. The Substitutability Concept: Implications for Research and Management. Journal of Leisure Research, V.6, no.2, 155-162.

Hendee, J.C. & Campbell, F.L. 1969. Social Aspects of Outdoor Recreation - The Developed Campground. Trends in Parks and Recreation, 13-16.

Hendee, J.C., Gale, P.G. & Catton, W.R. 1971. Typology of Outdoor Recreation Activity Preferences. Journal of Environmental Education, V.3, no.1, 28-34.

Hendee, J.C. & Roggenbuck, J.W. 1984. Wilderness - Related Education as a Factor Increasing Demand for Wilderness. A paper presented at the International Forest Congress, Quebec City, Canada, 6p.

Hendee, J.C., Stankey, G.H. & Lucas, R.C. 1978. Wilderness Management. USDA, FS, Miscellaneous Publication No.1365, 381p.

Hooker, C. 1976. Cultural Form, Social Institution, Physical System: Remarks Towards a Systematic Theory, in Man and His Environment, edited by M.F. Mohtadi, Oxford: Pergamon Press, 169-183.

International Union for the Conservation of Nature and Natural Resources. 1980. World Conservation Strategy, Morges, Switzerland: IUCN, 48p.

Isaac, S. 1971. Handbook in Research and Evaluation. San Diego, California: Edits, 186p.

Jackson, E.L. & Wong, R.A.G. 1982. Perceived Conflict Between Urban Cross Country Skiiers and Snowmobilers in Alberta. Journal of Leisure Research, V.14, no.1, 47-62.

Jacob, G.R. & Schreyer, R. 1980. Conflict in Outdoor Recreation: A Theoretical Perspective. Journal of Leisure Research, V.12, no.4, 368-380.

Jain, S.K. & Sastry, A.R.K. 1984. Safeguarding Plant Diversity in Threatened Natural Habitats, in Conservation of Threatened Natural Habitats, edited by A.V. Hall, South African National Scientific Programmes, Report No.92, Pretoria: CSIR, 155-164.

Jarman, M.L. (ed) 1986. Conservation Priorities in Lowland Regions of the Fynbos Biome, South African National Scientific Programmes, Report No.87, Pretoria: CSIR, 55p.

Johnson, R.M. 1974. Trade-off Analysis of Consumer Values. Journal of Marketing Research, V.11, 121-127.

Jubenville, A. 1971. A Test of Differences Between Wilderness Recreation Party Leaders and Party Members. Journal of Leisure Research, V.3, no.2, 116-119.

Jubenville, A. 1976. Outdoor Recreation Planning. Philadelphia: W.B. Saunders Co., 399p.

Jubenville, A. & Becker, R.H. 1983. Outdoor Recreation Management Planning: Contemporary Schools of Thought, in Recreation Planning and Management, edited by S.R. Lieber and D.R. Fesenmaier, London: E. & F.N. Spon Limited, 303-319.

Kelley, J.R. 1983. Social Benefits of Outdoor Recreation: An Introduction, in Recreation Planning and Management, edited by S.R. Lieber and D.R. Fesenmaier, London: E. & F.N. Spon Limited, 3-14.

Kneese, A.V. 1977. Economics and the Environment. Middlesex, England: Penguin Books, 285p.

Kraft, V. 1981. Foundations for a Scientific Analysis of Value, edited by H.L. Mulder, Dordrecht: D.Reidel, 195p.

Krech, D., Crutchfield, R.S. & Livson, N. 1974. Elements of Psychology, Third Edition, New York: Alfred A. Knopf, Inc., 874p.

Krieger 1973. What's Wrong With Plastic Trees? Science, V.179, 446-455.

Kruskal, J.B. & Carmone, P.J. 1968. Use and Theory of MONANOVA, a Programme to Analyze Factorial Experiments by Estimating Monotone Transformations of the Data. New Jersey: Bell Laboratories

Krutch, J.W. 1954. The Voice of the Desert: A Naturalist's Interpretation. New York: William Sloane Associates.

Krutilla, J.V. 1967. Conservation Reconsidered. American Economic Review, V.57, no.4, 777-786.

Krutilla, J.V. & Fisher, A.C. 1975. The Economics of Natural Environments: Studies in the Valuation of Commodity and Amenity Resources, Baltimore: John Hopkins Press, 292p.

La Page, W.F. 1983. Recreation Resource Management for Visitor Satisfaction, in Recreation Planning and Management, edited by S.R. Lieber and D.R. Fesenmaier, London: E. & F.N. Spon Limited, 277-285.

Lampard, E.E. 1964. The History of Cities in Economically Advanced Areas, in Regional Development and Planning, edited by J. Friedmann & W. Alonso, Massachussets: MIT Press, 321-342.

Leopold, A. 1934. Conservation Economics. Journal of Forestry, V.32, 537-544.

Leopold, A. 1953. Round River. New York: Oxford University Press, 178p.

Leopold, A. 1966. A Sand County Almanac. New York: Oxford University Press, 269p.

Lime, D.W. 1976. Principles of Recreation Carrying Capacity, in Proceedings of the Southern State Recreation Research Applications Workshop, USDA, FS General Technical Report SE-9, North Carolina: Southeastern Forest and Range Experiment Station, 122-134.

Lith, H. 1976. The Identification of Open Space in Comprehensive City Metropolitan and Regional Planning, Based on Sound Ecological, Landscaping and Planning Principles in, Proceedings of the First Conference on Recreation Research, Stellenbosch: Department of Nature Conservation, Faculty of Forestry, University of Stellenbosch, 271-277.

Lloyd, R.D. & Fischer, V.L. 1972. Dispersed Versus Concentrated Recreation as Forest Policy. Paper presented at the Seventh World Forestry Congress, Argentina, 16p.

Lucas, R.C. 1964. Wilderness Perception and Use: The Example of the Boundary Waters Canoe Area. Natural Resources Journal, V.3, no.1, 394-411.

Lucas, R.C. & Stankey, G.H. 1985. Role of Research in Applying the Limits of Acceptable Change System. Paper presented at the Southeastern Recreation research Conference, United States of America, 15p.

Luce, R.D. & Tukey, J.W. 1964. Simultaneous Conjoint Measurement: A New Type of Fundamental Measurement. Journal of Mathematical Psychology, V.1, 1-27.

Luckhoff, H.A. 1980. The Sederberg Wilderness Area, Bulletin 60, Pretoria: The Directorate of Forestry and Environmental Conservation, Department of Water Affairs, Forestry and Environmental Conservation, 27p.

Lutz, G.M. 1983. Understanding Social Statistics. New York: MacMillan Publishing Co. Inc., 530p.

Lutzenberger, J. 1984. Brazilian Wilderness: A Problem or a Model for the World?, in Wilderness the Way Ahead, edited by V. Martin and M. Inglis, Forres: The Findhorn Press/Middleton: Lorian Press, 38-46.

MacKaye, B. 1962. The New Exploration: A Philosophy of Regional Planning, Urbana, Illinois: University of Illinois Press, 243p.

Maddox, J. 1972. The Doomsday Syndrome. London: MacMillan, 248p.

Malan, J.G.S., Rabie, M.A. & Fuggle, R.F. 1983. Official Administration of Environment Affairs, in Environmental Concerns in South Africa, edited by R.F. Fuggle and M.A. Rabie, Cape Town: Juta & Co., Ltd, 111-132.

Manfredo, M.J., Brown, P.J. & Haas, G.E. 1980. Fishermen Values in Wilderness, in Proceedings of the Western Association of Fish and Wildlife Agencies, V.52, 276-297.

Manfredo, M.J., Driver, B.L. & Brown, P.J. 1983. A Test of Concepts Inherent in Experience Based Setting Management for Outdoor Recreation Areas. Journal of Leisure Research, V.15, no.3, 263-283.

Manning, R.E. 1985[a]. Crowding Norms in Backcountry Settings: A Review and Synthesis. Journal of Leisure Research, V.17, no.2, 75-89.

Manning, R.E. 1985[b]. Diversity in a Democracy: Expanding the Recreation Opportunity Spectrum. Leisure Sciences, V.7, no.4, 377-399.

Marsh, 1885. The Earth as Modified by Human Action: Last Revision of Man and Nature. New York: Scribner, 629p.

Marshall, R. 1933. The Forest for Recreation, in A National Plan for American Forestry, United States Senate Document, No.12, 72 Congress, United States Government Printing Office, 463-487p.

Marx, L. 1973. Pastoral Ideals and City Troubles, in Western Man and Environmental Ethics, edited by I.G. Barbour, London: Addison-Wesley Publishing Co., 93-115.

Maslow, A.H. 1954. Motivation and Personality. New York: Harper and Row, 411p.

Maslow, A.H. 1970. Motivation and Personality, Second edition. New York: Harper and Row, 369p.

Matthews, W.H. 1975. Objective and Subjective Judgments in Environmental Impact Analysis. Environmental Conservation, V.2, no.2, 121-130.

McAllister, D.M. 1980. Evaluation in Environmental Planning: Assessing Environmental, Social, Economic and Political Trade-offs. Cambridge: The Massachussets Institute of Technology Press, 308p.

McCabe, J.M. 1972. A Wilderness Primer. Environment Law Review, V.3, 443-468.

McClellan, K. & Medrich, E.A. 1969. Outdoor Recreation: Economic Considerations for Optimal Site Selection and Development. Land Economics, V.45, 175-182.

McCool, S.F. 1977. Selecting a Whitewater River Management Strategy, in Proceedings of the Symposium on Managing Colorado River Whitewater: The Carrying Capacity Strategy, edited by L. Roger, W.H. Becker and R. Schreyer, Logan, Utah: Institute for the Study of Outdoor Recreation and Tourism, 8-14.

McCool, S.F. & Elmer, J.S. 1975. Providing Recreational Opportunities Through State Park Systems. Utah Tourism and Recreation Review, V.4, no.3, 1-5.

McCool, S.F., Stankey, G.H. & Clark, R.N. 1985. Choosing Recreation Settings: Processes, Findings and Research Directions, in Proceedings - Symposium on recreation Choice Behaviour, compiled by G.H. Stankey and S.F. McCool, USDA, FS General Technical Report INT-184, Ogden, Utah: Intermountain Forest and Range Experiment Station, 1-8.

McCrea, S. 1983. We'll Come No More. Journal of the Mountain Club of South Africa, no.86, 65

McHarg, I.L. 1971. Design with Nature. New York: Doubleday & Co., Inc., 197p.

McHarg, I.L. 1973. The Place of Nature in the City of Man, in Western Man and Environmental Ethics, edited by I.G. Barbour, London: Addison-Wesley Publishing Co. Inc., 171-186.

McInerny, J. 1981. Natural Resource Economics: The Basic Analytical Principles, in Economics and Resources Policy, edited by J.A. Butlin, London: Longman, 30-58.

Meadows, D.H., Meadows, D.L., Randers, J. & Behrens, W.W. 1972. The Limits to Growth, New Edition, London: Pan Books, 205p.

Meester, J.A.J. 1982. The Value of Diversity. South African Journal of Zoology, V.17, no.1, 1-2.

Mehmet, O. 1978. Economic Planning and Social Justice in Developing Countries, London: Croom Helm Ltd., 282p.

Meier, C.A. 1984. Wilderness and the Search for the Soul of Modern Man, in Wilderness the Way Ahead, edited by V. Martin & M. Inglis, Forres: The Findhorn Press/Middleton: Lorian Press, 246-256.

Melnick, R.Z. 1983. Protecting Rural Cultural Landscapes: Finding Value in the Countryside. Landscape Journal, V.2, no.2, 85-96.

Mercer, D.C. (ed) 1977. Leisure and Recreation in Australia, Malvern: Sorrett, 256p.

Milbrath, L.W. 1982. Ecological Aspects of Quality of Life. Paper presented at Tenth World Congress of Sociology, Mexico City, Mexico, 17p.

Miller, P. 1982. Value as Richness: Toward a Value Theory for an Expanded Naturalism in Environmental Ethics. Environmental Ethics, V.4, no.2, 101-114.

Mills, D.G. 1926. The Cold Bokkeveld. The Annual of the Mountain Club of South Africa, no.29, 50-53.

Mishan, E.J. 1977. The Economic Growth Debate: An Assessment. London: Allen and Unwin, 277p.

Mitchell, L.S. 1979. Geographic Implications for Planning Urban Recreation, in Proceedings of the International Symposium on Research in Sport and Recreation, Stellenbosch: The South African Sports Federation, The Department of Sport and Recreation, the University of Stellenbosch, 26-61.

Mumford, L. 1946. The Culture of Cities, London: Secker and Warburg, 530p.

Murphy, J.F. & Howard, D.R. 1977. Delivery of Community Leisure Services: An Holistic Approach. Philadelphia: Lea & Febiger, 219p.

Myers, N. 1984. Problems and Opportunities in Habitat Conservation, in Conservation of Threatened Natural Habitats, edited by A.V. Hall, South African National Scientific Programmes, Report No.92, Pretoria: CSIR, 1-15.

Naess, A. 1973. The Shallow and the Deep, Long-Range Ecology Movements: A Summary. Inquiry, V.16, 95-100.

Naess, A. 1984. A Defence of the Deep Ecology Movement. Environmental Ethics, V.6, no.3, 265-270.

Nash, R. 1973. Wilderness and the American Mind, Revised Edition. New Haven: Yale University Press, 300p.

Nash, R. 1976. Wilderness: To Be or Not to Be?, in Nature and Human Nature, edited by W.R. Burch (Jr), Yale University: New Haven, 27-41.

Nash, R. 1982. Wilderness and the American Mind, Third Edition, New Haven: Yale University Press, 425p.

Nattrass, J. 1981. The South African Economy: Its Growth and Change. Cape Town: Oxford University Press, 328p.

Noe, F.P., Wellman, J.D. & Buyhoff, G.H. 1981-1982. Perception of Conflict Between Off-Road Vehicle and Non Off-Road Vehicle Users in a Leisure Setting. Journal of Environmental Systems, V.11, no.3, 223-233.

Odum, E.P. 1969. The Strategy of Ecosystem Development. Science, V.164, 262-270.

Odum, E.P. 1971. Fundamentals of Ecology, Third Edition, Philadelphia: W.B. Saunders Company, 574p.

Oppenheim, A.N. 1966. Questionnaire Design and Attitude Measurement. London: Heinemann, 298p.

O'Riordan, T. 1971. Perspectives on Resource Management. London: Pion Limited, 183p.

O'Riordan, T. 1976. Environmentalism. London: Pion, 373p.

O'Riordan, T. & Turner, R.K. (ed) 1983. An Annotated reader in Environmental Planning and Management, Oxford: Permagon Press, 460p.

Outdoor Recreation Resources Review Commission 1962. Outdoor Recreation for America. Washington D.C.: United States Government Printing Office, 246p.

Page, J. & Rabie, M.A. 1983. Land-use Planning and Control, in Environmental Concerns in South Africa, edited by R.F. Fuggle and M.A. Rabie, Cape Town: Juta & Co., Ltd., 445-482.

Partridge, E. 1984. Nature as a Moral Resource. Environmental Ethics, V.6, no.2, 101-130.

Patmore, J.A. 1983. Recreation and Resources. England: Basil Blackwell, 280p.

Peckelman, D. & Sen, S.K. 1979. Measurement and Estimation of Conjoint Utility Functions. Journal of Consumer Research, V.5, 263-271.

Pepper, D. 1984. The Roots of Modern Environmentalism, Kent: Croom Helm Ltd., 246p.

Pickles, J. 1978. Images of Landscape in South Africa with Particular Reference to Landscape Appreciation and Preferences in the Natal Drakensberg. Unpublished PhD thesis, University of Natal, Pietermaritzburg, South Africa, 428p.

Pigram, J.J. 1983. Outdoor Recreation and Resource Management. London: Croom Helm, 262p.

Pimm, S.L. 1984. The Complexity and Stability of Ecosystems. Nature, V.307, 321-326.

Porter, R.C. 1984. The Optimal Timing of an Exhaustible, Reversible Wilderness Development Project. Land Economics, V.60, no.3, 247-254.

Potter, D.R., Hendee, J.C. & Clark, R.N. 1973. Hunting Satisfaction: Game, Guns, or Nature?, in Proceedings of the 38th North American Wildlife Conference, 220-229.

Prescott-Allen, R. 1984. Threatened Habitats: The Challenges for Humanity, in Conservation of Threatened Natural Habitats, edited by A.V. Hall, South African National Scientific Programmes, Report No.92, Pretoria: CSIR, 16-45.

Proceedings of the First Conference on Recreation Research 1976. Stellenbosch: Department of Nature Conservation, Faculty of Forestry, University of Stellenbosch, 336p.

Rabie, M.A. & Theron, C.H.B. 1983. Soil, in Environmental Concerns in South Africa, edited by R.F. Fuggle and M.A. Rabie, Cape Town: Juta & Co., Ltd., 142-163.

Raimondo, J. 1985. Perceptions of a Guided Wilderness Trail. Unpublished MSc Thesis, University of Cape Town, South Africa, 82p.

Rayner, A.A. 1967. A First Course in Biometry for Agriculture Students, Pietermaritzburg, Natal: University of Natal Press, 626p.

Rettie, D.F. 1970. Plans Don't Work; People Do, in Elements of Outdoor Recreation Planning, edited by B.L. Driver, Ann Arbour: University of Michigan Press, 299-307.

Rickart, T.M. 1979-1980. Wilderness Land Preservation: The Uneasy Reconciliation of Multiple and Single Use Land Management Policies. Environmental Affairs, V.8, 873-917.

Rittel, H.W.J. & Webber, M.M. 1977. Dilemmas in a General Theory of Planning, in Planning for Social Welfare, edited by N. Gilbert and H. Specht, New Jersey: Prentice-Hall, 133-146.

Rokeach, M. 1973. The Nature of Human Values, New York: The Free Press, 438p.

Rolston, H, III, 1981. Values in Nature. Environmental Ethics, V.3, no.2, 113-128.

Rolston, H, III, 1985. Valuing Wildlands. Environmental Ethics, V.7, no.1, 23-48.

Saarinen, T.F. 1976. Environmental Planning, Perception and Behaviour. Boston: Houghton Mifflin, 262p.

Samuelson, P.A. 1955. Diagrammatic Exposition of a Theory of Public Expenditure. Review of Economics and Statistics, V.37, no.4, 350-356.

Santmire, H.P. 1973. Historical Dimensions of the American Crisis, in Western Man and Environmental Ethics, edited by I.G. Barbour, London: Addison-Wesley Publishing Co. Inc., 66-92.

Schreyer, R.M. 1976. Sociological and Political Factors in Carrying Capacity Decision Making, in Proceedings of the Third Resources Management Conference, USDI, National Park Service, Southwest Region Fort Worth, Texas, 228-258.

Schreyer, R. 1979. Succession and Displacement in River Recreation, Part I: Problem Definition and Analysis. Paper prepared for River Recreation Project, USDA, FS, St. Paul, Minnesota: North Central Forest and Range Experiment Station, 45p.

Schreyer, R., Knopf, R.C. & Williams, D.R. 1985. Reconceptualizing the Motive/Environment Link, in Proceedings - Symposium on Recreation Choice Behaviour, compiled by G.H. Stankey & S.F. McCool, USDA, FS General Technical Report INT-184, Ogden, Utah: Intermountain Forest and Range Experiment Station, 9-18.

Schweitzer, C.D. 1983. Environmental and Related Interest Groups in South Africa. Unpublished MSc thesis, University of Cape Town, South Africa, 171p and Appendices.

Scott, N.R. 1974. Toward a Psychology of Wilderness Experience. Natural Resources Journal, V.14, 231-237.

Seneca, J.J. & Taussig, M.K. 1984. Environmental Economics. New Jersey: Prentice-Hall Inc., 349p.

Shall, A. 1984. Conjoint Measurement for Concept Evaluation. Unpublished BSc Hon. thesis, University of Cape Town, South Africa, 55p.

Shelby, B. 1981. Encounter Norms in Backcountry Settings: Studies of Three Rivers. Journal of Leisure Research, V.13, 129-138.

Shields, A. 1973. Wilderness, Its Meaning and Value. Southern Journal of Philosophy, V.11, 240-253.

Siegel, S. 1956. Nonparametric Statistics for the Behavioural Sciences. Tokyo: McGraw-Hill, Kogakusha, 312p.

Singh, T.V. & Kaur, J. 1986. The Paradox of Mountain Tourism: Case References from the Himalaya. Industry and Environment, V.9, no.1, 21-26.

Skolimowski, H. 1975. Knowledge and Values. Ecologist, V.5, no.1, 8-15.

Snijders, H. 1984. Storm over the Cederberg. Journal of the Mountain Club of South Africa, no.87, 76-82.

Soule, M.E. & Wilcox, B.A. 1980. Conservation Biology: An Evolutionary-Ecology Perspective. Sunderland: Sinauer, 395p.

Southwick, C.H. 1976. Ecology and the Quality of Our Environment, New York: D. van Nostrand, 426p.

Sowman, M.R. 1984. An Assessment of Recreational Carrying Capacity at Infanta, South Cape. Unpublished MA thesis, University of Cape Town, South Africa, 149p.

Sowman, M.R. 1987. A Procedure for Assessing Recreational Carrying Capacity of Coastal Resort Areas. Landscape and Urban Planning, V.14, no.4, 331-344.

Stankey, G.H. 1972. A Strategy for the Definition and Management of Wilderness Quality, in Natural Environments: Studies in Theoretical and Applied Analysis, edited by J.V. Krutilla, Baltimore: John Hopkins University Press, 88-114.

Stankey, G.H. 1973. Visitor Perception of Wilderness Carrying Capacity. USDA, FS Research Paper INT-142, Ogden, Utah: Intermountain Forest and Range Experiment Station, 61p.

Stankey, G.H. 1974. Criteria for the Determination of Recreation Carrying Capacity in the Colorado River Basin, in Environmental Management in the Colorado River Basin, edited by A.B. Crawford, D.F. Petersen, Utah: Utah State University Press, 82-101.

Stankey, G.H. 1979. Some Social Concepts for Outdoor Recreation Planning, in Land and Leisure: Concepts and Methods in Outdoor Recreation, edited by C.S. van Doren, G.B. Priddle and J.E. Lewis, Chicago: Maaroufa Press Inc., 140-150.

Stankey, G.H. 1980. Wilderness Carrying Capacity: Management and Research Progress in the United States. Landscape Research, V.5, no.3, 6-11.

Stankey, G.H. & Brown, P.J. 1981. A Technique for Recreation Planning and Management in Tomorrow's Forests, in Proceedings of the XVII International Union of Forest Research Organizations World Congress, Japan, Division 6, 63-73.

Stankey, G.H., Brown, P.J. & Clark, R.N. 1983. Monitoring and Evaluating Changes and Trends in Recreation Opportunity Supply, in Proceedings of the Renewable Resource Inventories for Monitoring Changes and Trends Conference, edited by J.F. Bell and T. Atterbury, Oregon: Oregon State University, College of Forestry, 227-230.

Stankey, G.H., Cole, D.N., Lucas, R.C., Petersen, M.E. & Frissell, S.S. 1985. The Limits of Acceptable Change (LAC) System for Wilderness Planning. USDA, FS General Technical Report INT-176, Ogden, Utah: Intermountain Forest and Range Experiment Station, 37p.

Stankey, G.H. & Lime, D.W. 1973. Recreational Carrying Capacity: An Annotated Bibliography. USDA, FS General Technical Report INT-3, Ogden, Utah: Intermountain Forest and Range Experiment Station, 45p.

Stankey, G.H. & McCool, S.F. 1984. Carrying Capacity in Recreational Settings: Evolution, Appraisal, and Application. Leisure Sciences, V.6, no.4, 453-473.

Stankey, G.H., McCool, S.F. & Stokes, G.L. 1986. Limits of Acceptable Change: A New Framework for Managing the Bob Marshall Wilderness Complex, in Proceedings of the National Wilderness Research Conference: Current Research, USDA, FS General Technical Report INT-212, Ogden, Utah: Intermountain Forest and Range Experiment Station, 526-530.

Stauth, R.B. 1980. A Rationale for Maintaining Natural and Near-Natural Areas in Developing Countries. Unpublished MA thesis, University of Cape Town, South Africa, 329p.

Stauth, R.B. 1983. Environmental Economics, in Environmental Concerns in South Africa, edited by R.F. Fuggle and M.A. Rabie, Cape Town: Juta & Co., Ltd., 82-110.

Steyn, J.N. 1980. Ontspanning in die Pretoria-Witwatersrand-Vereeniging Gebied: Aktiwiteite, Voorkeure, Behoeftes en Ruimtelike Patrone. Occasional Publication, Pretoria: SAVLOR.

Susskind, C. 1973. Understanding Technology, Baltimore: John Hopkins University Press.

Sutcliffe, M.O. 1979. A Behavioural Study of Recreation in the Natal Drakensburg. Unpublished MSc thesis, University of Natal, South Africa, 200p.

Taljaard, E.P.S. 1983. Recreation in Cape Town Metropolitan Area: Patterns and Preferences. Unpublished paper, Parks and Recreation Administration, Department of Nature Conservation, University of Stellenbosch, 12p.

Taylor, V. 1984. Outdoor recreation of Whites in the Cape Town Metropolitan Area: The resource Base and Utilization Patterns. Publication No.13/1984 Stellenbosch: Institute of Cartographic Analysis, University of Stellenbosch, 217p.

The Cape Times 1984. Officials Talk on Cedarberg Park, in Cape Times, 3 May, 14.

The Ecologist 1972. Blueprint for Survival. The Ecologist, V.2, no.1, 1-43.

The International Symposium on Research in Sport and Recreation 1979, Stellenbosch: The South African Sports Federation, Department of Sport and Recreation, University of Stellenbosch, 336p.

Thomas, K. 1983. Man and the Natural World: Changing Attitudes in England 1500 - 1800. London: Allen Lane, 425p.

Thoreau, H.D. 1962. Walden or, Life in the Woods. New York: Crowell-Collier Publishing Company, 255p.

Tinley, K.L. 1979. The Maintenance of Wilderness Diversity in Africa, in Voices of the Wilderness, edited by I. Player, Johannesburg: Jonathan Ball Publishers, 29-42.

Tuan, Y. 1974. Topophilia: A Study of Environmental Perception, Attitudes and Values, New Jersey: Prentice-Hall Inc., 249p.

Tuan, Y. 1978. Environment and the Quality of Life, in Sourcebook on the Environment, edited by K.A. Hammond, G. Macinko and W.B. Fairchild, Chicago: University of Chicago, 613p.

Turner, A. 1982. Reconciling Preservation and Use: Managing National Parks in New South Wales. Geographical Survey of New South Wales. Conference Papers, No.3.

Underhill, L.G. 1985. Introstat, Fourth Edition, Cape Town: Juta & Co., 431p.

United Nations. 1977. Desertification: Its Causes and Consequences. Oxford: Permagon Press, 448p.

United Nations Educational, Scientific & Cultural Organisation 1973. Programme on Man and the Biosphere: Conservation of Natural Areas and of the Genetic Material They Contain, MAB Report Series 12, Morges, Switzerland, 64p.

United Nations Educational, Scientific & Cultural Organisation 1974. Programme on Man and the Biosphere: Task Force on Criteria and Guidelines for the Choice and Establishment of Biosphere Reserves, MAB Report Series 22, Paris, 61p.

United States Council on Environmental Quality 1980. The Global 2000 Report to the President: Entering the Twenty-First Century, Volume One, 47p.

United States Department of Agriculture, Forest Service, 1986. ROS Book, USDA, FS.

United States Department of the Interior, Bureau of Land Management, 1981. Manual Section 8320. Planning for Recreation Resources, Washington DC: USDI BLM.

van Oosterzee, P. 1984. The Recreation Opportunity Spectrum: Its Use and Misuse. Australian Geographer, V.16, no.2, 97-104.

Vaske, J.J., Graefe, A.R., Shelby, B. & Heberlein, T.A. 1986. Backcountry Encounter Norms: Theory, Method and Empirical Evidence. Journal of Leisure Research, V.18, no.3, 137-153.

Wagar, J.A. 1963. Campgrounds for Many Tastes. USDA, FS Research Paper INT-6, Ogden, Utah, Intermountain Forest and Range Experiment Station, 10p.

Wagar, J.A. 1964. The Carrying Capacity of Wildlands for Recreation, Washington D.C.: Society of American Foresters (Monograph 7), 24p.

Wagar, J.A. 1966. Quality in Outdoor Recreation. Trends in Parks and Recreation, V.3, no.3, 9-12.

Wagar, J.A. 1974. Recreational Carrying Capacity Reconsidered. Journal of Forestry, V.72, no.5, 274-278.

Wagar, J.V.K. 1946. Services and Facilities for Forest Recreationists. Journal of Forestry, V.44, no.11, 883-887.

Wagar, J.V.K. 1951. Some Major Principles in Recreation Land Use Planning. Journal of Forestry, V.49, no.6, 431-435.

Washburne, R.F. 1982. Wilderness Recreational Carrying Capacity: Are Numbers Necessary? Journal of Forestry, V.80, no.11, 726-728.

Watson, R.A. & Smith, P.M. 1971. Underground Wilderness: A Point of View. International Journal of Environmental Studies, V.2, 217-220.

Watt, K.E.F. 1972. Man's Efficient Rush Toward Deadly Dullness. Natural History, V.81, no.2, 74-82.

Weisbrod, B.A. 1964. Collective Consumption Services of Individual-Consumption Goods. Quarterly Journal of Economics, V.LXXVIII, no.3, 471-477.

West, P.C. 1982. Effects of User Behavior on the Perception of Crowding in Backcountry Forest Recreation. Forest Science, V.28, no.1, 95-105.

Westfall, R.D. & Hoffman, E.L. 1983. Planning and Policy-Making: The View from Within the Agency, in Recreation Planning and Management, edited by S.R. Lieber and D.R. Fesenmaier, London: E. & F.N. Spon Limited, 396p.

Westman, W.E. 1977. How Much Are Nature's Services Worth? Science, V.197, no.4307, 960-965.

Wiley, J. 1984. Cederberg Wilderness Area. Press Statement By the Honourable John Wiley, MP, Minister of Environment Affairs and Tourism. 2 November 1984, 3p.

Williams, R. 1985. The Country and the City. London: Hogarth, 335p.

Williams, D.R. & Knopf, R.C. 1985. In Search of the Primitive-Urban Continuum. The Dimensional Structure of Outdoor Recreation Settings. Environment and Behavior, V.17, no.3, 351-370.

Wilson, E.O. 1984. Million-Year Histories: Species Diversity as an Ethical Goal. Wilderness, V.48, no.165, 12-17.

Womble, P. & Studebaker, S. 1981. Crowding in a National Park Campground: Katmai National Monument in Alaska. Environment and Behavior, V.13, no.5, 557-573.

Wood, J.P. 1980. Recreation Opportunity Spectrum: A Framework for Assessing the Provision of Recreational Resources. Paper presented to the 53rd National Conference of the Royal Australian Institute of Parks and Recreation.

Wootton, B. 1977. Political Freedom, in Planning for Social Welfare, edited by N. Gilbert and H.Specht, New Jersey: Prentice-Hall, Inc., 35-43.

World Commission on Environment & Development 1987. Our Common Future. Oxford: Oxford University Press, 383p.

Young, R.A. & Crandall, R. 1984. Wilderness Use and Self-Actualization. Journal of Leisure Research, V.16, no.2, 149-160.

Young, G., Steiner, F., Brooks, K. & Struckmeyer, K. 1983. Determining the Regional Context for Landscape Planning. Landscape Planning, V.10, no.4, 269-296.

Zuvekus, C. 1979. Economic Development. An Introduction, London: MacMillan Press Ltd., 433p.

APPENDIX A: METHOD OF DATA COLLECTION

Two basic approaches to obtaining survey information are possible, namely: interviews (personal or telephonic) and self-administered questionnaires (see e.g. Babbie 1973; Bentham et al 1982; Churchill 1983). In the present study, interviewing visitors in person would have provided detailed information for the survey, but was not a practical option because of limited resources. The complex nature of the intended survey could not readily be dealt with by the telephone interview approach. Respondents might feel rushed in answering complex questions and produce erroneous information.

The self-administered questionnaire approach was thus selected for collecting survey data. The following considerations also influenced the selection of the self-administered questionnaire approach:

(1) Sampling control - The inquiry can readily be directed to the designated respondents.
(2) Information control - This approach avoids bias due to interviewer-interviewee interactions. Respondents can also work at their own pace and give more thought to each question, This approach, however, does not readily enable respondents to provide additional information to the researcher or to ask questions should any misunderstanding arise. Each question therefore fails or succeeds on its own merits. Careful questionnaire design and rigorous pre-testing can however, help to overcome these problems.
(3) Administrative control - This approach is likely to be the cheapest, but may require more time than the telephone interview approach.

Several alternative methods of conducting self-administered questionnaires were considered, namely: deliver and collect

questionnaires, by hand, on-site; deliver questionnaires, by hand on-site, and return by mail; and mail questionnaires to respondents for return by mail. The eventual choice of sampling frame determined the method of conducting the questionnaire. A mail survey of a random sample of overnight visitors to the Cederberg over the period of a year was selected for the following reasons:

(1) It provides a representative reflection of visitor attitudes. Generalisations can therefore be made about the population of visitors to the Cederberg.
(2) Inferential statistics can be used in the analysis of the results (see Section 6.4.1).
(3) Practical and administrative on-site difficulties are avoided.

The following limitations of this approach were recognised:

(1) Only "group leaders", or the person in whose name the site was booked, would be surveyed. The opinion of group leaders and other group members may differ (Jubenville 1971:116-119).
(2) Recollection of the visit may not be clear. This was not seen to be an important consideration in view of the hypothetical nature of the questions (visitors would not be required to remember details specific to their visit).
(3) Any confusion or misunderstanding regarding questionnaire completion cannot be readily explained to respondents. To alleviate this problem a contact address, and during- and after-hour telephone numbers were provided on the covering letter to the questionnaire (see Appendix D). In addition, the method of survey follow-ups facilitated verbal discussion of any persistent problems (see Section 6.4.2).
(4) Probing respondents for more detailed information is impossible. Provision was however made in question 8 of

the survey questionnaire for respondents to express any additional concerns.

(5) Response rates may be lower in the case of a mailed questionnaire. This can be obviated, to an extent, by ensuring that the questionnaire is appealing and retains the respondent's interest. This was an important consideration in the design and construction of the questionnaire.

APPENDIX B: QUESTIONNAIRE DESIGN AND CONSTRUCTION

B.1 Introduction

Two considerations were given particular attention in the design and construction of this questionnaire (see e.g. Oppenheim 1966; Babbie 1973; Churchill 1983):

(1) The need to avoid biasing the survey results by the wording and format of the questionnaire:
   (a) Biased statements, leading questions and "loaded" words were avoided. No mention was made of the "Cederberg Controversy" or National Parks Board, and words such as "development" and "wilderness" were not used, to reduce the possibility of respondents adopting a partisan view in completing the questionnaire.
   (b) The ordering of questions can bias respondent's answers. This consideration was thus given particular attention in the pre-testing and pilot survey.
   (c) The meaning of questions must be clear to the respondent. Precise, simple terminology was used so that respondents would know what was being asked of them. Jargon, negative items, ambiguous words or questions, and double-barrelled questions were avoided.

(2) The need to ensure that the questionnaire appealed to respondents and maintained their interest during its completion:
   (a) The questionnaire should look important. It was decided that the Department of Environmental and Geographical Science (University of Cape Town) letterhead should be used on the covering letter to establish the credibility of the research, and to indicate that the research is independent of the "Cederberg Controversy".

(b) An effort was made to appeal to the intellectual curiosity and self-esteem of respondents.

(c) The objectives of the research were clearly stated and a map of the area was included to orientate respondents and to stimulate interest.

(d) The content of the questionnaire was kept to a minimum. Only questions aimed at vital information were included. The questionnaire was printed back-to-back to minimise length. In addition, each question was kept short as possible. Instructions to complete each question were clear but concise. A lengthy format was favoured over a shorter but possibly more time-consuming format.

(e) An effort was made to ensure that the questionnaire lay-out was uncluttered, with lots of "white space".

(f) The questions were designed and constructed to provide variety.

(g) Each question was clearly numbered and distinguished from the preceding and following question.

(h) Classification questions were asked last and kept to a minimum.

(i) Respondents were asked if they had any general comments about recreation in the Cederberg. This open-ended question enabled respondents to provide information pertinent to them but not dealt with in the questionnaire. Respondents might be more willing to complete the questionnaire on being given the opportunity to "air their views".

(j) A self-addressed, postage-paid envelope was provided to facilitate problem-free return of the questionnaire.

The questionnaire focusses on three key elements of the ROS concept, namely recreation settings, activities and experiences.

B.2 The Design and Construction of the Setting Question

Section 6.3.1 provides the background for this application of conjoint analysis to a study of visitor attitudes about the appropriate recreation setting for the Cederberg.

B.2.1 Selection and Synthesis of Attributes and Their Levels

Table 5 provided the basis for distinguishing hypothetical recreation settings in the Cederberg. It was decided that the developed setting was not appropriate for the area. The Cederberg is a very important water catchment and has considerable value for nature conservation (see Section 2.3.2). This necessitates that a large proportion of the area is maintained in a natural condition. Providing a developed setting in the Cederberg would result in a significant compromise of these values and is unlikely to be seriously considered for the foreseeable future. This setting was therefore excluded as being irrelevant. This reduced the number of attribute levels to three. Following Cosper and Kinsley's (1984:230) "rough rule of thumb" the least number of profiles required to minimise the possibility of interactions between attributes would therefore be 3 X 3 = 9 (see Section 6.3.1.1).

Consideration was given to further reducing the total number of attribute combinations to be ranked. Blake (1982:13) recommended that the part-worth of an attribute level not presented to respondents, but which lies between two specified attribute levels, can be calculated on the basis of interpolation. Calculating the part-worth of an attribute level by interpolation assumes a linear progression between the attribute levels. This assumption was considered to be justifiable because the part-worth function model states that the utility of a given multi-attribute object is the sum of part-worths for each of the attribute levels (Blake 1982:12). Moreover, the implied relationship between the physical,

biological, social and managerial conditions that describe recreation settings is linear. For example, as environmental conditions change from unnatural to natural, social and managerial conditions change in a corresponding manner (Manning 1985[b]:384-385).

By using interpolation the researcher can more easily ensure that the attribute levels presented to respondents are far enough apart to be perceived as realistically distinct (Blake 1982:19). Consideration was thus given to excluding the semi-primitive attribute levels from the profile descriptions. It was however, considered to be necessary to make a fine distinction between each of the attribute levels in the case of the restrictions and controls and modification attributes. The inclusion of the semi-primitive level of these attributes in the profile descriptions was judged to be necessary in the light of comments from respondents in pre-testing, regarding the complexity of these attributes. In addition, consideration of these attributes at the semi-primitive level was considered to be particularly pertinent in the light of the National Parks Board proposal (see Section 2.4).

In terms of the current management policy, restrictions and controls are laid down primarily for the protection of the environment and the wilderness experience (see Section 2.3.2). Visitors are essentially free to choose their route and the place they want to stop overnight. In terms of the National Parks Board's proposal, it is likely that such visitor freedom would be somewhat restricted, over and above the restrictions and controls instituted for the protection of the environment. This visitor regimentation is most likely to take the form of a choice of designated hiking routes that have to be followed by visitors as on National Hiking Way Trails (NHWT). These conditions relate closely to those outlined for the semi-primitive level (see Table 5). It was therefore considered important to have respondents specifically evaluate this attribute at this level. An

associated consideration arising from the National Park Boards proposal was the planned establishment of a number of "rustic" valley camps for hikers in the currently undeveloped area of the Cederberg. This proposal would necessitate a degree of modification that would appropriate the semi-primitive level. Hence, it was considered important to have respondents also evaluate this specific option.

In pre-testing the profile descriptions, a number of respondents recommended that the modification attribute should be simplified. A considerable amount of information was contained in the description of the attribute (see Table 5) and much of this was considered to be interrelated. It was decided that the nature of visitor facilities was the most pertinent consideration in the context of the Cederberg and that this alone would be indicative of the degree of modification. The level of visitor and management impact, and the level of non-recreation resource use were therefore not included in the profile descriptions. Future applications of conjoint analysis should take these attributes into account.

Respondents found the distinction between the different levels of the inter-party contact and access attributes, in the context of the Cederberg, simpler and more obvious. This suggested that interpolation of the semi-primitive level of these attributes could be undertaken with more confidence. Thus four attributes, with two at two levels and two at three levels, were finally selected for this application of conjoint analysis (see Table 6). The total number of distinct profiles that can be described on the basis of this format is 2 X 2 X 3 X 3 = 36. An orthogonal design was used to determine the prespecified combination of attribute levels (see Table B1, page ix). Orthogonal arrays represent the lowest number of combinations available for the estimation of the main-effect parameter. This assumes that all interaction effects can be ignored (Green 1975:63). A necessary and sufficient condition for the main effects of any two

attributes not to interact is that each level of one attribute occurs with each level of another attribute in proportional frequencies (Blake 1982:26).

TABLE B1: AN ORTHOGONAL ARRAY OF FOUR ATTRIBUTES, TWO AT TWO LEVELS AND TWO AT THREE LEVELS
(Source: Blake 1982:168)

A	B	C	D
1	1	1	1
1	2	2	3
1	1	3	2
2	1	2	2
2	2	3	1
2	1	1	3
1	1	3	3
1	2	1	2
1	1	2	1

The orthogonal design enables the measurement of all possible attribute combinations on the basis of rankings of only nine profiles. This number exceeds the minimum number of profiles required to limit interactions between attributes, namely 3 X 2 = 6 (Cosper et al 1984:230). In addition, based on the results of pre-testing and the pilot survey, nine profiles were not judged to overload respondents.

B.2.2 Data Collection Methods for the Independent Variables

There are two data collection approaches for conjoint analysis:

(1) The two-attribute-at-a-time approach, whereby the respondent trades one attribute off against another, ranking the various combinations of each pair of attribute levels.
(2) The full-profile approach, whereby the respondent ranks

a set of alternatives, with each profile comprising different levels of each attribute.

Although the two attribute-at-a-time approach is easy to apply, and does not overload respondents with too much information, Blake (1982:16-17) lists a number of disadvantages that arise in its application. These include:

(1) By reducing the set of attributes to a two-at-a-time combination it presents somewhat unrealistic alternatives.
(2) Respondents may be uncertain as to what should be assumed about the attributes not being considered in a specific evaluation task.
(3) A large number of judgments may be required.
(4) Responses may become patterned.

The full-profile approach presents far more realistic information to the respondent. The main limitation of this approach is the possibility of information overload (Blake 1982:18). The full-profile data collection method was chosen in preference to the two-attribute-at-a-time approach because of the importance of presenting realistic information to the respondents. It is recognised that although this approach requires fewer judgments to be made, each is more complex. Particular attention was therefore given to reducing the possibility of information overload in the selection and synthesis of attributes and their levels. Using the full-profile data collection method, the respondent is usually given a set of cards, with each card describing a prespecified combination of different levels of each attribute. Respondents are then asked to rank the cards.

B.2.3 Measurement Scales for the Dependent Variable

The dependent variable (e.g. perceptions of an appropriate recreation setting) can be measured by rating scales

(assuming approximate interval scale properties) or by rank order (non-metric, at best ordinal data). The rank order approach was adopted because it is considered to be more reliable than the rating approach for a study of this nature. It was also considered to be easier for a respondent to choose which profile is preferred, rather than express the magnitude of the preference (Blake 1982:23; Shall 1984:18).

B.2.4 Profile Description and Presentation

A number of alternative profile formats are possible. In a study of perceptions of the relative importance of attributes determining a successful wilderness trail, Raimondo (1985) adopted a scenario format. The attributes were not specified to respondents, but the description of each scenario differed in terms of the prespecified levels of each attribute. For example, Scenario T was described thus (Raimondo 1985:28):

> SCENARIO T:
> There was little group interaction and even though the guide did not give much of himself, he was very knowledgeable about the true wilderness through which you hiked.

Raimondo (1985:25-26) used synonyms to vary the descriptions of the attribute levels and hence the profiles. The following advantages were cited: it is easy to assimilate; it required no supporting explanations; it appeals to respondents. The disadvantages cited include: it was an untried format of presentation; there are possible discrepancies in the interpretation of the scenario because of undefined words and people interpreting the meaning of the adjectives differently.

Raimondo (1985:25) tested a key-word format that required an explanation of the attributes, but less explanation of the attribute levels.

This format was presented as follows:

SCENARIO T:
Guide : neutral
Impact : unspoilt area
Awareness : increase in cognitive domain
Group : neutral interaction

It was found that some combinations were difficult to rank using the key-word format. Respondents were confused by the number of options within the prespecified combinations, and by the differing perceptions they had of the meaning of each word (Raimondo 1985:25).

Schweitzer (1983) used three levels of attributes (high, medium and low) to judge which hypothetical environmental group displayed the most advantageous combination of attribute levels. Each attribute was specifically defined so that all respondents interpreted them in a similar manner. Four attributes were selected and presented in the following manner (Schweitzer 1983:54):

GROUP A:
High : organisation, finance
Medium :
Low : cohesion, skills

Several respondents encountered difficulties in ranking the groups. This might have been resolved by more detailed attribute definitions (Schweitzer 1983:58-59). In addition, it is possible that the levels, high, medium or low, meant different things to different respondents, since no explanation of the terms was indicated.

To ensure that meaningful data was collected in the Cederberg study, particular attention was given to the description and presentation of profiles. A number of pre-tests were done to ascertain which profile format would be most clearly understood by respondents and best retain their attention.

Table 5 formed the basis for the development of (1) key-word and (2) scenario formats. A total of 12 reformulations were undertaken in order to derive the final pre-test set of nine scenarios. A thesaurus and dictionary of synonyms were used to generate synonymous descriptions of the attribute levels. Each profile was identified by a letter rather than a number, to reduce the possibility of respondents assuming a preferred ordering of the scenarios. The order of attribute descriptions in each profile was also varied.

(1) Key-Word Format:

Key-words were derived in a series of pre-tests to synthesise the information contained in Table 5. An example of the way in which they were presented is as follows:

Profile R

INTER-PARTY CONTACT	: unexpected and rare
ACCESS	: motorised on gravel roads
RESTRICTIONS AND CONTROLS	: moderate visitor regimentation
MODIFICATION	: comfortable and convenient visitor facilities

(2) Scenario Format:

A scenario depicting the same attribute levels as the example above was presented as follows:

Profile R

The facilities apparent in the area offer many conveniences and are accessible via a well maintained gravel road. Visitors are moderately restricted in their choice of activities, but are able to experience complete solitude.

To compare the key-word and scenario formats 11 post-graduate students and researchers in the Department of Environmental and Geographical Science (University of Cape Town) completed a questionnaire. Respondents were asked to rank two sets of nine cards each, one depicting the scenario format and the other using the key-word format. Respondents were asked to

note, with reasons, which set of cards was more difficult to rank, which held their attention most, and which took the longest time to complete. The results are outlined in Table B2.

TABLE B2: A COMPARISON BETWEEN THE SCENARIO AND KEY-WORD FORMATS

	MORE DIFFICULT	HELD ATTENTION MOST	LONGEST TIME TO COMPLETE
SCENARIOS	2	8	3
KEY-WORDS	9	3	5 (3 equal)
TOTAL	11	11	11

It was found that, in general, the scenarios were less difficult to rank and held respondent attention better than the key-word format. The time taken to complete the exercise was slightly longer with the key-word format. Based on discussions with the respondents, and given their written comments, it was found that the scenario format provided more information, provoked the imagination, and created a "gut-feeling" about the profiles that facilitated easier ranking. Concern was expressed that the meaning and implication of terms was not altogether clear, raising the likelihood that respondents might interpret the scenarios differently. This could produce spurious results. With regard to the key-word format, it was generally felt that insufficient information was contained in the cards, but that this format was more precise than the scenario format.

A number of suggestions arose from these tests. Respondents felt that the attribute restrictions and controls was too vague, causing some confusion as to its implications for the visitor. It was decided that in the context of the "Cederberg Controversy", the most important manifestation of restrictions and controls was in the selection of one's

hiking/walking route. Selecting a route was thus used as a surrogate for restrictions and controls in the next stage of the study. It was also felt that a degree of clarity was lost by varying the wording to describe attribute levels. It was therefore decided to keep variations, in the description of attribute levels, to a minimum. On the basis of these tests it was decided that a new format should be adopted, combining the scenario and key-word approach. In this way attributes would be clearly specified, variations in respondent interpretation would be reduced, and assimilation would be readily facilitated. An example of this format is presented as follows:

Profile R:

INTER-PARTY CONTACT	: Rare and unexpected
ACCESS	: A few gravel roads provide access for vehicles
SELECTING A ROUTE	: Parties may select one of the permitted walking routes
VISITOR FACILITIES	: The accommodation provides many conveniences

B.2.5 Question Instructions

Particular attention was given to this aspect of the design and construction of the questionnaire because of the relative complexity of the setting question. Numerous pre-tests were conducted on people with a variety of backgrounds and experiences. Detailed feedback was obtained to ensure that the instructions were simple and clear. It was decided that the best means of achieving this was to guide the respondent step-by-step through the setting question. The disadvantage of a slightly long set of instructions was considered to be justified because respondents would then be better able to timeously and accurately complete the question.

Although the response to the setting question required only a ranking of the profiles, rating the profiles before ranking them has been said to facilitate more accurate assessment of profiles (Raimondo 1985:31). This was confirmed during pre-tests in this application of conjoint analysis. In addition, using both rating and ranking approaches provides a means of checking the consistency of respondent's answers. In the light of comments received in pre-testing, the rating and ranking components of the setting question were distinguished as two separate questions (on different pages) in the pilot survey. This minimised any misunderstanding about the difference between rating and ranking.

To rate the profiles, step-by-step instructions were provided and supported by an example. A six-level rating scale was used. Respondents therefore did not have the option of a neutral category. This forced respondents to make a decision as to the degree of profile suitability for the Cederberg. The nature of the profiles made it unlikely that respondents would consider them to be of "neutral suitability" for the Cederberg. This view was supported in discussions with pre-test and pilot survey respondents. This six-level scale was also judged to be adequate for respondents to distinguish the relative suitability of profiles without forcing many ties. The rating exercise was found to considerably aid the respondents in ranking the profiles. Respondents were requested to complete the ranking table by filling in the letter of the cards from least to most suitable. To facilitate the analysis, respondents were asked not to tie profile rankings (Blake 1982:24).

B.3 The Design and Construction of the Activities Question

B.3.1 Question Format

A close-ended question format was adopted comprising a comprehensive list of hypothetical activities. These

activities were to be rated on a four-level scale to distinguish whether the activities were perceived to be inappropriate, fairly inappropriate, fairly appropriate or appropriate for the Cederberg (See Appendix D). An itemised rating scale was adopted for the following reasons:

(1) This format presents the range of activities clearly to respondents.
(2) The same range of activities can be rated by all respondents.
(3) It ensures uniformity of responses, facilitating easy data processing and analysis.
(4) It provides an easy and quick response format for respondents. This was considered to be particularly important given the complex nature of the question on settings.
(5) The rating scale provides information about the respondent rather than activities which are the object of the ratings.
(6) The descriptive label of each level of the rating scale provides a frame of reference for respondents.
(7) Although many researchers favour a rating scale with a neutral category, a four-level scale was used in this question so that respondents had to decide whether an activity was relatively appropriate or inappropriate. Respondents could not avoid this decision by selecting a neutral category merely to save time. Pre-tests and the pilot survey indicated that a four-level scale adequately distinguished the appropriateness of activities.

The following are possible disadvantages of the close-ended format:

(1) The questionnaire may not provide an adequate range of activities. This was negated by including an "other"

category which enabled respondents to add any activities they considered to be relevant.

(2) The question may seem long to respondents. This was compensated by the fact that this format facilitates quick responses.

(3) The format does not enable the respondent to add any provisions or give reasons for answers. This was not considered to be significant because the focus of this survey is on the "what" rather than the "why" question.

(4) This format may structure respondent's answers by forcing a choice between the given categories. By excluding a neutral category from the rating scale, respondents may be forced to select a category that does not actually reflect their perception. This was given particular attention in pre-testing and the pilot survey, and was not found to be of concern to respondents. The absence of a neutral category ensured that respondents gave more attention to the trade-offs between the categories "fairly appropriate" and "fairly inappropriate".

B.3.2 Selection of Activities

To select activities several pre-tests were conducted using students and researchers in the Department of Environmental and Geographical Science who had visited the Cederberg. Respondents were asked to rate a list of activities, in terms of appropriateness for the Cederberg, and to add any other possible activities that might be appropriate, or inappropriate, for the area. Activities that might not be clearly understood were described briefly or some examples provided. Respondents were also asked to indicate the kind of setting (given the attributes outlined in Table 5) usually associated with an activity.

Following the pre-tests a more detailed explanation of the activities backpacking and NHWT was given to clarify the

distinction between the two. The pre-tests facilitated broad generalisations to be made about associations between activities and different settings as depicted in Figure 10. For a more detailed understanding of associations between particular activities and setting conditions in the South African context however, further research needs to be undertaken. To ensure that activities associated with particular settings were not grouped together, the activities were alphabetically ordered for the pilot survey. This also negates an implied ordering of activities.

B.3.3 Questionnaire Instructions

Under a title, INSTRUCTIONS TO COMPLETE THE QUESTIONNAIRE, respondents were asked to read the instructions carefully before answering each question. They were then directed to a map which outlined the area of the Cederberg referred to in the question. To stimulate interest, and to provide a frame of reference, respondents were asked to imagine they were planning the future of the area. They were then asked how appropriate each activity was for the area. Respondents were instructed to mark an X in one block per activity.

B.4 The Design and Construction of the Experiences Question

B.4.1 Question Format

A close-ended itemised rating scale format was adopted for this question. Respondents were asked to indicate the importance of each experience category on a four-level scale. The advantages and disadvantages of this format have been discussed in Appendix B.3.1.

B.4.2 Selection of Experiences

The experience categories used in compiling the initial list of experiences are outlined in Figure 11. Short descriptive

phrases were used to outline each experience category. The categories and their descriptive phrases were presented to respondents in pre-tests. Respondents were asked to rate each experience according to its importance in their visit to the Cederberg and to add to, or delete, any of the categories or descriptive phrases if necessary. The final list of experience categories and descriptive phrases is outlined in Figure 12. Only the descriptive phrases were presented in the pilot survey for ease of comprehension. They were ordered to ensure a mix of experiences.

B.4.3 Question Instructions

Respondents were asked to indicate how important each of the listed considerations was to them in visiting the Cederberg. Pre-tests indicated that by including the word "experiences" or the phrase "experiential considerations", the clarity of the question was reduced. These were therefore excluded from the question in the pilot survey. Respondents were instructed to mark an X in a block for each consideration.

APPENDIX C: THE PILOT SURVEY

C.1 The Pilot Questionnaire

A covering letter was used to introduce the questionnaire. A map that clearly outlined the area pertinent to the survey was included in the questionnaire. This provided a frame of reference and visual appeal. The map was not printed on the back of the covering letter because it could be seen through the page. This would reduce the appeal of the questionnaire on first sight. It was thus necessary to print the map on the second page of the questionnaire, after the general instructions to complete the questionnaire had been outlined to respondents.

During pre-tests, attention was given to the possibility of the order of questions influencing respondent's level of interest in completing the questionnaire. In the light of comments made by respondents, the questions were ordered as follows: settings, activities, experiences and classification questions. The settings question was considered by some respondents to be complicated and time-consuming. It is common practice to ask difficult questions at the end of a questionnaire, but respondents suggested that the setting question should be asked first for the following reasons:

(1) It was likely to be a novel consideration to respondents, arousing curiosity and drawing attention.
(2) It involved "hands-on" active participation from respondents in the rating and ranking of profiles.
(3) The question is of a general nature and therefore was a good introduction to the questionnaire.

The activities question was asked next and was considered to be simple and quick to complete. The experience question was of a more personal nature and led on to the classification questions which were asked last. Pilot survey respondents

were given the opportunity to make any comments pertinent to them regarding recreation in the Cederberg and to outline any difficulties they might have had in completing the questionnaire. There is however, no means of ensuring that respondents actually answered the questions in this sequence.

C.2 Conducting the Pilot Survey

Having pre-tested the various stages of the questionnaire design and construction it was necessary to undertake a pilot survey of a sample of the target population. Ideally a pilot survey should entail a miniature walkthrough of the entire study, from sampling to reporting (Babbie 1973:211). Limited time and resources precluded this. The pilot survey nonetheless enabled each stage of the survey to be examined with attention given to the implications for the final survey. The main objectives of this pilot survey were to:

(1) Examine the conceptual basis of the survey in the light of respondents' answers and comments.
(2) Assess the questionnaire design and construction, particularly in terms of question clarity and the ordering of questions.
(3) Review the data analysis procedure.

The pilot survey was directed at visitors on site because it facilitated detailed discussions with respondents about completion of the questionnaire. In addition, it could be completed over a short time period and would be relatively inexpensive. The main disadvantage of this approach is that it does not yield a completely representative sample. Wilderness visitors could not be sampled on site because of the practical difficulty of locating them. This consideration does not however, prevent the attainment of the objectives outlined above.

Permission was obtained from the Directorate of Forestry to conduct the survey in the area, and a time period was selected that was suitable to the owners of Kromrivier and Dwarsrivier, and the forestry officials at Algeria. The pilot survey was conducted during the weekend of the 8-10 November 1985. It was established that the maximum expected number of visitors to the area over the survey period would be approximately 300. Copies of the questionnaire were made and collated. The nine setting profiles were enclosed in envelopes and stapled to each questionnaire.

Daily trips were made to Dwarsrivier and Kromrivier from Algeria to deliver and collect questionnaires. Visitors to Algeria were handed questionnaires and asked to return them, on completion, to a clearly marked and conveniently placed box. A 35% response rate was achieved. At Dwarsrivier, questionnaires were handed to visitors by Mrs H. Nieuwoudt and a box was provided for their return. Not one respondent returned a completed questionnaire. At Kromrivier, questionnaires were handed out to respondents and collected at a pre-arranged time. Visitors could also return their completed questionnaires via a box provided at the booking office. A 78% response rate was achieved.

C.3 Pilot Survey Results

C.3.1 The Sample

Fairly substantial differences in the age and home-language of respondents from Algeria and Kromrivier were apparent. It was therefore anticipated that differences in the profile of hiker, camper and bungalow visitor groups would be found in the final survey.

C.3.2 The Appropriate Setting

The relative importance of attributes in describing the

appropriate setting to all respondents was: inter-party contact (31%); selecting a route (27%); visitor facilities (22%); and access (20%). The ideally appropriate setting for all respondents was characterised by rare and unexpected contact with other parties, access to the area on foot, the opportunities for visitors to go where they wish, and the provision of overnight shelters. It could be inferred that for all respondents the primitive setting achieved a rating of 78%, given that the above combination of attributes described the ideal setting (i.e. rated as 100%). The semi-developed setting achieved only a 12% rating against the ideal.

There was little evidence of differences between respondents from Algeria and Kromrivier regarding the importance of attributes, or the relative appropriateness of alternative settings. There was also little apparent difference between the groups regarding the relative importance of a change in the level of an attribute on defining the appropriateness of the recreation setting. These results were contrary to expectations. These results may, however, not have been very accurate because the pilot study sub-groups were small and may not have been representative of all visitors to these sites.

C.3.3 Activities

If the activities perceived to be "fairly appropriate" or "appropriate" by the majority of respondents were to be catered for in the Cederberg in the future, the following would be included: rock climbing (98% of respondents); swimming in rivers (98%); backpacking (97%); day walks (95%); nature study (93%); NHWT (88%); caravanning (82%); picnicking (73%); horse riding (70%); fishing (58%); and trailing (54%). In general, respondents consider activities usually associated with primitive and semi-primitive settings to be appropriate for the area.

As anticipated, fairly substantial differences were apparent in the attitudes of respondents from Algeria and Kromrivier regarding the appropriateness of several activities, including: hang-gliding (31% difference between groups); scenic drives (30%); trailing (27%); cycling (20%); and indoor games (18%). These results, as indicated in Appendix C.3.2, could however, be unreliable.

C.3.4 Experiences

It emerged that the following experiential considerations were important or very important to the majority of respondents in a visit to the Cederberg: aesthetic (100% of respondents); escaping pressure (98%); religious/spiritual (90%); physical exercise (88%); learning about the natural history of the area (82%); solitude (80%); and family/friend togetherness (72%). It was anticipated that respondents from Kromrivier would consider strengthening family and/or friendship bonds and meeting other people to be more important than would Algeria respondents. A difference of 18% regarding the former provided some evidence to support this view. With regard to the latter however, the opposite may hold (i.e there was a difference of 15% in favour of Algeria respondents).

It also emerged that fairly substantial differences existed between respondents regarding the importance of learning about the natural history of the area (26%) and gaining a sense of achievement (16%). As indicated in Appendix C.3.2 these results may however, not be very reliable.

C.4 Implications of the Pilot Survey

C.4.1 Conceptual Basis of the Survey

Written comments received in the pilot survey, and discussions held with respondents, confirmed that the focus

on settings, activities and experiences was central to the question of: "What recreation opportunities are perceived to be appropriate for the currently undeveloped area of the Cederberg?"

Discussions with recreation planners, managers and researchers indicated that the pilot survey results and intended final survey would provide a useful starting point for planning future recreation use of the Cederberg. Particular interest was expressed about the application of conjoint analysis to a study of visitor perceptions of the appropriate setting for the area.

C.4.2 Questionnaire Design and Construction

The decision to undertake a mail-survey (see Section 6.2) was reinforced by practical difficulties experienced in delivering and collecting questionnaires to respondents at different sites. Several changes to the format and wording of the pilot questionnaire and covering letter were however, needed for the purposes of a mail survey. Particular attention was given to ensuring that language used in the covering letter, and each question, was simple and precise because the questionnaire would have to succeed on its own merits. Telephone numbers were nonetheless given in the covering letter to resolve any difficulties respondents may have in completing the questionnaire.

Several respondents indicated that they had found the setting questions "quite difficult". Although the question instructions were considered to be clear, they had had some difficulty in ranking the scenarios. A concerted effort was made to simplify this process. In discussions held with respondents it was suggested that the attributes should be consistently ordered in each profile to facilitate easier assessment of the trade-offs. In subsequent testing it was found that this approach simplified the ranking process.

It was recommended that the alphabetic ordering of activities in the pilot survey questionnaire be replaced by a carefully selected listing in the final survey questionnaire. To avoid any indication of bias, a "neutral" activity was listed first. Thereafter several activities were selected to provide an indication of the range of activities included in the question. No additional activities were included in the final survey because only a few respondents specified "other" activities (e.g. astronomy and transcendental meditation). It was suggested that cycling was an "unrealistic" activity for the Cederberg and that motorbike trails were a more practical consideration. The order of the rating scale for the activities question was changed to be consistent with the rest of the questionnaire. The experiences question was found to be adequate for the final survey.

The pilot survey demonstrated that it would be best to begin the questionnaire with a simple question. This consideration was held to be particularly pertinent for a mail survey. For the purpose of the final survey, questions were therefore ordered as follows: activities, experiences, settings and classification questions.

C.4.3 Data Analysis Procedure

Particular attention was given to the possibility of extending the MONANOVA programme from a 2 X 2 X 3 matrix to a 4 X 3 matrix. This extension would have facilitated direct measurement of the inter-party contact and access attributes at the semi-primitive level. The extension could not, however, be achieved in the time available to the researcher. The analysis of the setting question in the pilot survey was, nonetheless, considered to be acceptable for the final survey given the exploratory nature of this study. The results of the setting question in the pilot survey adequately demonstrated the usefulness of an application of conjoint analysis to a study of this nature.

The pilot survey provided a clear indication of the attitudes of all respondents, and sub-groups, concerning appropriate activities for the Cederberg and important experiences in a visit to the area. Rigorous tests of significant differences between the attitudes of respondents from different sites was not considered appropriate for the pilot study. Pre-testing nonetheless, indicated that the format of the activities and experiences questions readily facilitated chi-square testing of such differences for the final survey.

UNIVERSITY OF CAPE TOWN

Department of Environmental and Geographical Science

University of Cape Town · Private Bag, Rondebosch 7700
Telephone: (021) 698531 · Telegrams: "Alumni Cape Town" · Telex 57-22208

OOK IN AFRIKAANS VERKRYGBAAR

Dear Cederberg Visitor,

Your help is needed to find out what kind of recreation is most suitable for the undeveloped area of the Cederberg. By completing this questionnaire, you will provide information useful for future planning and management of recreation in the Cederberg.

Your name was selected in a random sample from the records of visitors to the Cederberg over the past year.

The objective of the questionnaire is to find out what recreation you, the visitor, consider to be appropriate for the undeveloped area of the Cederberg. The questionnaire is part of an independent research project being done in the Department of Environmental and Geographical Science at the University of Cape Town. The landowners and Directorate of Forestry have given their approval for the project.

There are no right or wrong answers to the questions - it is your opinion that is important. Your answers will be anonymous and treated in strict confidence.

To make an accurate assessment of visitor opinion, it is important that I receive a high rate of response. Please make every effort to complete and return your questionnaire as soon as possible, preferably before the 14th December 1985.

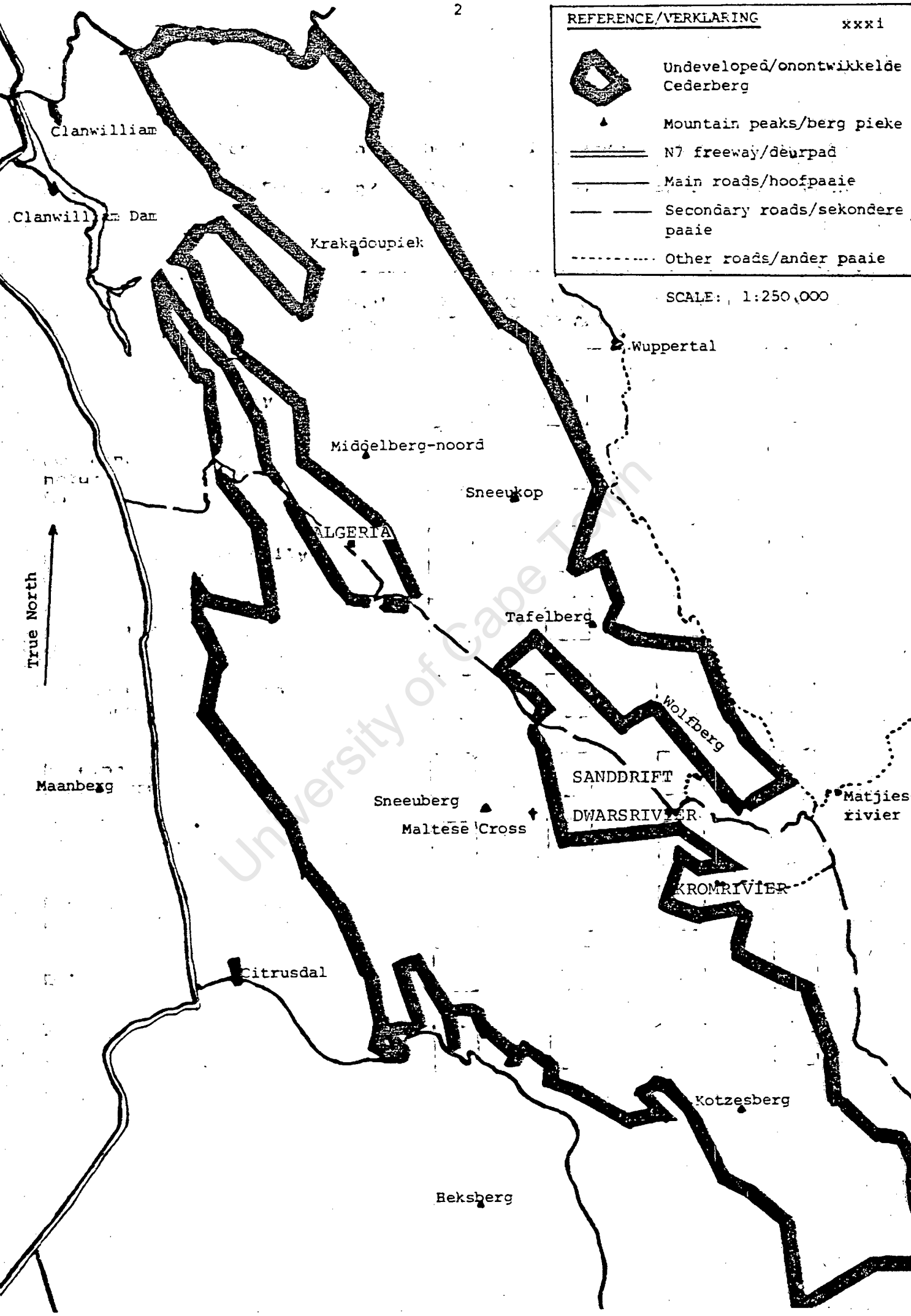
A self-addressed and postage-paid envelope is enclosed for the return of your completed questionnaire.

Should you have any difficulties in completing the questionnaire, please phone me at (021) 69 8531 ext. 186 during office hours, or at (021) 69 1185 after hours.

Thanking you in advance for assisting in this research.

Yours sincerely

Signed by candidate
Signature Removed
BRUCE C. GLAVOVIC



To help classify your answers, please would you answer the following questions? Your answers will be anonymous, and treated in strict confidence. (Mark an X in the appropriate block.)

5 How many times have you visited the Cederberg?

1	2	3	4	5 +

6 Your sex : Male ☐ Female ☐

7 Your age :

15 - 24		45 - 54	
25 - 34		55 - 64	
35 - 44		65 +	

8 Are there any comments you would care to make about recreation in the Cederberg?

MY SINCERE THANKS FOR YOUR ASSISTANCE!

APPENDIX E: PROFILES USED IN THE SETTING QUESTION OF THE SURVEY

H:
INTER-PARTY CONTACT: Rare and unexpected
ACCESS: On foot.
SELECTING A ROUTE: Visitors are told which route they must follow.
VISITOR FACILITIES: Well-equipped chalets.

C:
INTER-PARTY CONTACT: Rare and unexpected
ACCESS: On foot.
SELECTING A ROUTE: Visitors are told which route they must follow.
VISITOR FACILITIES: Overnight shelters are provided.

J:
INTER-PARTY CONTACT: Rare and unexpected
ACCESS: On foot.
SELECTING A ROUTE: Visitors may select one of the permitted routes.
VISITOR FACILITIES: No facilities are provided.

L:
INTER-PARTY CONTACT: Other parties will often be met.
ACCESS: On foot.
SELECTING A ROUTE: Visitors plan their own routes.
VISITOR FACILITIES: Well-equipped chalets.

N:
INTER-PARTY CONTACT: Rare and unexpected
ACCESS: On foot.
SELECTING A ROUTE: Visitors plan their own routes.
VISITOR FACILITIES: No facilities are provided.

R:
INTER-PARTY CONTACT: Rare and unexpected
ACCESS: A few gravel roads provide access for vehicles
SELECTING A ROUTE: Visitors may select one of the permitted routes.
VISITOR FACILITIES: Well-equipped chalets.

E:
INTER-PARTY CONTACT: Other parties will often be met.
ACCESS: On foot.
SELECTING A ROUTE: Visitors may select one of the permitted routes.
VISITOR FACILITIES: Overnight shelters are provided.

W:
INTER-PARTY CONTACT: Rare and unexpected
ACCESS: A few gravel roads provide access for vehicles
SELECTING A ROUTE: Visitors plan their own routes.
VISITOR FACILITIES: Overnight shelters are provided.

T:
INTER-PARTY CONTACT: Other parties will often be met.
ACCESS: A few gravel roads provide access for vehicles
SELECTING A ROUTE: Visitors are told which route they must follow.
VISITOR FACILITIES: No facilities are provided.

APPENDIX F: CONVERTING PART-WORTHS TO PERCENTAGES

MONANOVA generates part-worths for each attribute level. Since these part-worths are interval scaled with common unit, but arbitrary origins, the user is advised to adjust the values to be more obviously meaningful. This adjustment is accomplished by unitising each value, and then adding a constant to each row to make zero the smallest row value. Percentages can then be calculated (Shall 1984: Appendix C:13). (P: PRIMITIVE SP: SEMI-PRIMITIVE SD: SEMI-DEVELOPED)

CONJOINT ONE:

	PART-WORTHS			UNITISED PART-WORTHS			RATIO SCALE (%)		
	P	SP	SD	P	SP	SD	P	SP	SD
INTER-PARTY CONTACT	1.16	---	-1.16	42.89	---	-42.89	85.78† (27)	---	0.00 (0)
ACCESS	0.99	---	-0.99	36.81	---	-36.81	73.63† (23)	---	0.00 (0)
SELECTING A ROUTE	0.97	0.60	-0.57	36.04	22.15	-58.18	94.22† (29)	80.33 (25)	0.00 (0)
VISITOR FACIL-ITIES	-0.87	0.99	-0.03	-32.30	33.30	-1.00	0.00 (0)	65.60† (20)	31.3 (10)

(Σ† = 100 %)

CONJOINT TWO:

	PART-WORTHS			UNITISED PART-WORTHS			RATIO SCALE (%)		
	P	SP	SD	P	SP	SD	P	SP	SD
INTER-PARTY CONTACT	1.12	---	-1.12	36.19	---	-36.19	72.39† (24)	---	0.00 (0)
ACCESS	1.00	---	-1.00	32.35	---	-32.35	64.71† (22)	---	0.00 (0)
SELECTING A ROUTE	0.84	0.63	-1.47	27.06	20.26	-47.32	94.64† (32)	67.58 (23)	0.00 (0)
VISITOR FACIL-ITIES	-1.07	1.04	0.03	-34.48	33.48	1.00	0.00 (0)	67.86† (23)	35.48 (12)

HIKERS:

	PART-WORTHS			UNITISED PART-WORTHS			RATIO SCALE (%)		
	P	SP	SD	P	SP	SD	P	SP	SD
INTER-PARTY CONTACT	1.05	---	-1.05	14.94	---	-14.94	29.89[t] (24)	---	0.00 (0)
ACCESS	1.14	---	-1.14	16.21	---	-16.21	32.49[t] (26)	---	0.00 (0)
SELECTING A ROUTE	1.33	-0.07	-1.26	19.04	-1.0	-18.03	37.07[t] (29)	17.03 (13)	0.00 (0)
VISITOR FACIL-ITIES	0.82	0.24	-1.06	11.71	3.49	-15.20	26.91[t] (21)	18.69 (15)	0.00 (0)

CAMPERS:

	PART-WORTHS			UNITISED PART-WORTHS			RATIO SCALE (%)		
	P	SP	SD	P	SP	SD	P	SP	SD
INTER-PARTY CONTACT	1.15	---	-1.15	42.48	---	-42.48	84.96[t] (27)	---	0.00 (0)
ACCESS	0.71	---	-0.71	26.11	---	-26.11	52.22[t] (17)	---	0.00 (0)
SELECTING A ROUTE	0.98	0.72	-1.70	36.22	26.78	-63.00	99.22[t] (32)	89.78 (29)	0.00 (0)
VISITOR FACIL-ITIES	-0.99	1.02	-0.03	-36.59	37.59	-1.00	0.00 (0)	74.18[t] (24)	35.59 (11)

BUNGALOW VISITORS:

	PART-WORTHS			UNITISED PART-WORTHS			RATIO SCALE (%)		
	P	SP	SD	P	SP	SD	P	SP	SD
INTER-PARTY CONTACT	1.14	---	-1.14	3.68	---	-3.68	7.36[t] (27)	---	0.00 (0)
ACCESS	0.93	---	-0.93	3.01	---	-3.01	6.02[t] (22)	---	0.00 (0)
SELECTING A ROUTE	0.68	0.79	-1.47	2.19	2.55	-4.74	6.93[t] (25)	7.29 (26)	0.00 (0)
VISITOR FACIL-ITIES	-1.23	0.92	0.31	-3.97	2.97	1.00	0.00 (0)	6.94[t] (25)	2.97 (11)

APPENDIX G: LIST OF PEOPLE CONSULTED

Professor Abromowitz, Department of Psychology, University of Cape Town, South Africa.
Mr R.A. Andrag, Chief Directorate of Forestry, Department of Environment Affairs, South Africa.
Mr S. Archer, Department of Economics, University of Cape Town, South Africa.
Mr R. Ballantyne, Department of Environmental and Geographical Science, University of Cape Town, South Africa.
Professor Bigalke, Department of Nature Conservation, University of Stellenbosch, South Africa.
Professor J. Butler-Adam, Institute of Socio-Economic Research, University of Durban-Westville, South Africa.
Dr G. Cooke, Department of Environmental and Geographical Science, University of Cape Town, South Africa.
Dr T.T. Dunne, Department of Mathematical Statistics, University of Cape Town, South Africa.
Professor R.F. Fuggle, Department of Environmental and Geographical Science, University of Cape Town, South Africa.
Mr B. Gasson, Department of Town and Regional Planning, University of Cape Town, South Africa.
Professor Gizinsky, formerly Department of Economics, University of Cape Town, South Africa.
Mr P.D. Glavovic, Department of Private Law, University of Natal (Durban), South Africa.
Professor G.E. Haas, Department of Recreation Resources and Landscape Architecture, Colorado State University, Fort Collins, Colorado, USA.
Professor S.F. McCool, School of Forestry, University of Montana, Missoula, Montana, USA.
Mrs H. Nieuwoudt, private landowner, Cederberg, South Africa.
Mrs O. Nieuwoudt, private landowner, Cederberg, South Africa.
Mr G. Pretorius, Chief Directorate of Forestry, Department of Environment Affairs, South Africa.
Dr J. Raimondo, Department of Environmental and Geographical Science, University of Cape Town, South Africa.
Mr R.B. Stauth, Department of Environmental and Geographical Science, University of Cape Town, South Africa.
Professor J.N. Steyn, Vice-Chancellor, Cape Technikon, South Africa.
Professor T.J. Stewart, Department of Mathematical Statistics, University of Cape Town, South Africa.
Dr E.P.S. Taljaard, Department of Nature Conservation, University of Stellenbosch, South Africa.
Mr V. Theunissen, Planner, Department of Local Government, Cape Provincial Administration, South Africa.
Mr S.V. van der Merwe, Chief Directorate of Forestry, Department of Environment Affairs, South Africa.
Professor M. Versveld, formerly Department of Philosophy, University of Cape Town, South Africa.
Mr M. Viviers, formerly Chief Directorate of Forestry, Department of Environment Affairs, South Africa.