

CONSERVATION AWARENESS AMONGST WHITE  
ADOLESCENTS IN SOUTH AFRICA: A STUDY  
OF SENIOR SECONDARY PUPILS IN NATAL

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The study represents original work by the researcher and has not been submitted in any form to another university. Where use was made of the work of others it has been duly acknowledged in the text. The method of presentation follows that suggested in the University of Natal Style Manual for Theses (1978). The Harvard system of referencing has been used. Mention of a writer is followed by the date of the relevant work which is listed alphabetically in the references at the end of the dissertation. Only in the case of a direct quotation from a writer is the page number listed.

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"Come forth into the light of things,  
Let Nature be your teacher."

William Wordsworth

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LIST OF ABBREVIATIONS USED IN THE TEXT

a. Relating to research programme, tables and figures

U	Urban pupils	
R	Rural pupils	
A	Afrikaans speaking pupils	
E	English speaking pupils	
♂	Male pupils	
♀	Female pupils	
m	Afrikaans speaking males	
f	Afrikaans speaking females	
M	English speaking males	
F	English speaking females	
UA	Urban Afrikaans speaking pupils	
RA	Rural Afrikaans speaking pupils	
UE	Urban English speaking pupils	
RE	Rural English speaking pupils	
U♂	Urban males	
U♀	Urban females	
R♂	Rural males	
R♀	Rural females	
Um	Urban Afrikaans speaking males	
Uf	Urban Afrikaans speaking females	
Rm	Rural Afrikaans speaking males	
Rf	Rural Afrikaans speaking females	
UM	Urban English speaking males	
UF	Urban English speaking females	
RM	Rural English speaking males	
RF	Rural English speaking females	
'x'	Farmer's children	} Applicable only in Tables 5.17, 6.27 and Figure 7.1
'y'	Pupils who have lived abroad	
'z'	Pupils studying agriculture	
CAWT	Conservation Awareness Test	
IBE	Index of Background Experience	
AVI	Accompanying Verbal Instructions	
SA	South Africa	} Applicable in Tables 8.31 and 8.32
W	World	
WLS	Wildlife society	} Applicable only in Table 6.6
CSC	Cedara School Camps	
JV	Joint Venture	} Applicable only in Table 6.7
LSC	Land Service Camps	
NPB	Natal Parks Board	
VV	Veld and Vlei	
WLSc	Wilderness Leadership School	

AGRIC Agriculture  
 BIOL Biology  
 GEOG Geography

N The total number of respondents to any particular question  
 n The number of respondents in any sub-group or combination of  
 sub-groups  
 $\Sigma$  The sum of  
 $\sigma$  Standard deviation  
 m Mean (average)  
 r Coefficient of correlation  
 + Positive  
 - Negative  
 %N/n See explanation on p.70.

b. Relating to organisations and references cited

ACE African Conservation Education (Programme)  
 BEE Bulletin of Environmental Education  
 CERI Centre for Educational Research and Innovation  
 CSIR Council for Scientific and Industrial Research  
 HMSO Her Majesty's Stationery Office  
 HSRC Human Sciences Research Council  
 IBE International Bureau of Education  
 IBRD International Bank for Reconstruction and Development  
 ICBP International Council for Bird Protection  
 IUCN International Union for the Conservation of Nature and Natural  
 Resources  
 IWMEE International Working Meeting on Environmental Education in the  
 School Curriculum  
 KSAT Keep South Africa Tidy  
 MEEP Maine Environmental Education Project  
 NAAE National Association for Environmental Education  
 NEA National Education Association  
 NEAC National Environmental Awareness Council  
 NED Natal Education Department  
 OECD Organisation for Economic Co-operation and Development  
 RECCE Rhodesian Education Courses for Conservation of the Environment  
 REED Review of Environmental Education Developments  
 RSA (SA) Republic of South Africa  
 RSADNE Republic of South Africa Department of National Education  
 RSADPE Republic of South Africa Department of Planning and the Environment  
 RSADWFE Republic of South Africa Department of Water Affairs, Forestry  
 and Environmental Conservation  
 SABC South African Broadcasting Corporation  
 SACCAP South African Council for Conservation and Anti-Pollution  
 SANF South African Nature Foundation  
 SANU South African Nature Union  
 SARCCUS Southern African Regional Commission for the Conservation and  
 Utilisation of the Soil  
 TCPA Town and Country Planning Association  
 UK United Kingdom  
 UKDES United Kingdom Department of Education and Sciences

UKDOE United Kingdom Department of Environment  
UKFC United Kingdom Forestry Commission  
UNEP United Nations Environment Programme  
UNESCO United Nations Educational, Scientific and Cultural Organisation  
UNISA University of South Africa  
US (USA) United States of America  
USDA United States Department of Agriculture  
USDHEW United States Department of Health, Education and Welfare  
USDI United States Department of Interior  
USOEE United States Office of Environmental Education  
USSR Union of Soviet Socialist Republics  
WLSSA Wildlife Society of Southern Africa  
WWF World Wildlife Fund



## CHAPTER 1    INTRODUCTION

### 1.1 Man's relationship to his environment

There is a continuing and dynamic interaction between Man and his milieu. Western man's ability to act destructively towards his natural environment is well documented, as is the fact that this behaviour is inevitably to his own detriment (e.g. Carson, 1962; Merton, 1968; Commoner, 1969, 1970a, 1970b, 1972; Dorst, 1970; Ehrlich & Ehrlich, 1970; Nicholson, 1972; Ward & Dubos, 1972; Hanks, 1976; Ward, 1979; IUCN, 1980; Soulé & Wilcox, 1980; WLSSA, 1980.) The basis of this statement is not only the rapid depletion of non-renewable resources, but the unwise use, abuse and near destruction of renewable resources such as forests, ocean harvests and wildlife, much of which has not yet been scientifically investigated.

The causes of this situation are multifold. Our economic systems and philosophy make a god of unlimited economic growth, and profits are sacrosanct, resulting in an emphasis on short term economic gain, often irrespective of pollution or health hazards (Brachi, 1971). Add to this the exponential growth rate of human populations in many places (e.g. KwaZulu), rapidly outstripping the ability of the earth's resources to provide sustenance (Hanks, 1980; WLSSA, 1980b). As expressed by Commoner (1970a, p.274):

"If we are to survive we need to become aware of the damaging effects of technological innovations, determine their economic and social costs, balance these against the expected benefits, make the facts broadly available to the public and take the action needed to achieve an acceptable balance of benefits and hazards."

or put in stronger terms by Aldous Huxley (1970, p.329):

"Only when we get into our collective head that the basic problem confronting twentieth-century man is an ecological problem will our politics improve and become realistic."

That man cannot be separated from his environment is an obvious truism which applies equally to the natural world and the world of his own creation, including buildings, settlements and culture. He is both a creature and a creator of the surroundings he inhabits — a relationship of infinite complexity which should never be lost sight of. Likewise that the earth is finite, is a truism all too frequently ignored. The attitude

that there are 'plenty more fish in the sea' is a common one. Far less often does one find an approach which Aldo Leopold (1933, 1949) referred to as man's moral obligation to husband carefully the resources of air, land and water. Now that all habitable parts of the globe are occupied, the careful husbandry of the earth is a sine qua non for the ultimate survival of the human and probably of most other species. The biosphere contains many delicate processes which have taken aeons to evolve and there is a natural equilibrium for life-sustaining processes dependent on relatively slow rates of recycling. The fact that these rates have been greatly exceeded by man are by no means obvious and can only become known to people by education. What Aldrich and Blackburn (1975, p.173) have said of the United States is also true for all mankind:

"The US will not become an environmentally conscientious country by passing legislation and developing environmental protection policies based on scientific soundness and sociological platitudes. Preservation of a quality environment will only become a reality if we can develop broad citizen understanding of the short-range and long-range objectives of sound environmental management, and citizen acceptance of the financial and personal commitment necessary to achieve those objectives. The gap between goals and actuality is the one to be filled by environmental education."

In behavioural and holistic terms, only when we understand the relationship of individual and group behaviour to the environment at large, are we likely to be able to affect modifications leading to desired environmental changes.

## 1.2 The scope, aims and objectives of the study

Accepting for the present that the term environment pertains to all around us, both natural and man-made, and that conservation means 'the wise use of', this research is concerned with education about conservation of the natural environment. It is part of a wider and distant goal which conservationists often refer to as an environmentally literate population. The primary aim is to contribute, in the South African context, to bridging the gap between goals and actuality by investigating a small part of the foundations upon which any such attempt must rest. Such a part is the establishment of baseline data on knowledge, beliefs and attitudes at present not available to us.

The specific area chosen for detailed examination is the state of conservation

awareness (as defined in Chapter 2) of White children in Natal near the end of their formal secondary education i.e. standard 9 pupils with an average age of approximately 17 years, hereafter referred to as the target group.

This particular group was chosen for the following reasons:

- a. The next two decades are regarded as critical by many environmentalists. It is in part from the target group that the decision-makers and those with positions of influence will emerge over the next 20 years.
- b. Many of the values and attitudes which the 17-18 year old will carry through life have already been formed or at least begun to gel. It is common cause among educational psychologists that the reasoning and deductive abilities of sub-adult adolescents are far closer to those of an adult than to those of children, who are in many ways unsystematic and illogical (Piaget, 1966, 1975; Boyle, 1969).
- c. Members of the target group were close to the end of their formal secondary education so that any evaluation of knowledge and attitudes measured partly the impact of this. From this point of view standard ten pupils would have been preferred but access to that group was restricted by examinations and other school pressures. A delay of six months to wait for the following year's standard ten's was meaningless. An advantage of the standard 9 group was the possibility of comparison with results of broadly similar research on 15-16 year olds carried out in Australia, the United States, the United Kingdom and Japan.
- d. The researcher's familiarity with the White education system in Natal. As very little previous research of this nature could be traced at the outset of the study, the need to proceed in stages became evident very early in the investigation.

In defining the area of research full cognisance has been taken of the wider issues of environmental education and awareness as they relate to all the people of South Africa (see Chapter 2). There is full recognition of the fact that research should not be confined to isolated fields or to particular cultural groups within our society. The apparent narrowness of the present concern is however in part counterbalanced by:

- a. The international context and reference of environmental education in which the research as a whole is set.
- b. The possibility that the lack of awareness of environmental issues in general is likely to be as acute among the members of a technological culture as among their technologically less sophisticated countrymen.
- c. The widely held view among conservationists, shared by the researcher, that nature conservation must be seen within the entire environmental framework. In common with any educational programmes aimed at promoting empathetic values, nature conservation must not be seen in isolation from the social, economic, political and technological phenomena of our time.

It is recognised too that concepts such as perspective and perception and indeed concept formation itself, form an integral part of a study such as this. Here the writer must however bow to higher judgement and for present purposes use the terms in a generally acceptable form. Much has been written about concepts and the term is still elusive (Pritchard, 1971; Saveland, 1976) but it is taken here simply to mean a general idea or body of knowledge pertaining to an issue. Following Saveland (1976, p.3) perception is taken to deal with "what we look at, or choose to notice", while perspective is "how we look at things".

A subsidiary research aim was to devise, and test in operation, a technique for measuring and giving a value to the level of conservation awareness of the target group and to relate this to certain background experiences. The technique chosen was to undertake a sample survey with a statistically scored questionnaire, details of which are discussed in later chapters. In formulating the aims a number of objectives were set. These were:

- a. To evaluate in statistical terms how 'conservation aware' the target group was. The intention was not to measure any changes in attitude but the situation at a single point in time. It was also not intended at this stage to examine the relationship of attitude to either factual or conceptual knowledge but rather to measure the total awareness against selected background or experiential variables.

Following Jahoda and Warren (1966, p.7) the operational definition of an attitude is taken to be "a response to a specific stimulus or as the internal organisation of past experiences with a class

of objects in the external world", thus embracing cognitive, behavioural and affective components. In harmony with this, Maldague (1976, p.197), referring to Dalen and Tipton (1974), states his belief that an attitude in confronting an environmental issue, results from:

- " i. an inner predisposition which may be more or less influenced by one's surroundings,
- ii. the extent to which knowledge and skills may be applied to the problem. ...

It can be supposed that the progressive development of environmental understanding, if effected in a co-ordinated fashion, will influence the creation of certain attitudes on the part of students."

He reminds us in the same context however not to forget that, "According to the law of creativity, each child sees himself as an individual from all others."

- b. To set up a model for this type of evaluation against which other models and research results might be compared.
- c. To establish some of the factors in pupils' backgrounds which might play a role in determining environmental and conservation awareness, and thereby to provide possible answers as to how the level of awareness relates to direct, indirect or non-exposure to environmental and conservation experiences. It should be made clear however that the study is not concerned with methodology of environmental or conservation education, but simply the results expressed as awareness.
- d. To provide answers to the following questions;
  - i. Whether there are significant differences in awareness between Afrikaans and English speaking pupils, boys and girls, or between the pupils of urban and rural schools. It was assumed that rural schools would largely represent rural children with a rural background and upbringing and that urban schools would likewise represent children with an urban background and upbringing — a point examined in greater detail in Chapter 4.
  - ii. Whether there are certain areas of weakness or strength in the pupils' environmental knowledge.
  - iii. What the target group perceives as the most serious national and international environmental problems.
- e. To offer pointers to some of the directions which future environmental or conservation awareness programmes in South Africa might consider.

In framing the objectives the researcher's experience with both teachers and pupils has played a significant part.

### 1.3 Assumptions upon which the study is based

Throughout the formulation and implementation of the study three basic assumptions have been made. Although implicit in the aims and objectives, they should be clearly stated, and are:

- a. That education to create and develop awareness of environmental issues and conservation principles is worthwhile and will have a beneficial effect in the future. While it has not been possible to trace any empirical evidence clearly proving this particular relationship, it is simply an extension of the ultimate assumption upon which all education is based. Whatever weakness the assumption may have it is certainly widespread and encountered in nearly all research in the field (IUCN, 1979).
- b. That environmental and conservation awareness can be measured and quantified. This assumption is based upon a substantial body of literature measuring and quantifying other aspects of knowledge and attitudes. As Maldague (1976, p.200) notes:  
"Since anything can be evaluated, the methods used in evaluating environmental education are not greatly different from those used for standard subjects in the [school] curriculum."
- c. That the responses obtained in the survey of the sample group are essentially honest and, within statistical limitations, are a reasonably reliable indicator of the knowledge and beliefs of the target group.

### 1.4 The hypotheses stated

Based on the aims, objectives and assumptions as outlined, the following hypotheses are postulated for acceptance or rejection.

- a. That there would be a clear relationship between pupils' background experiences in environmental or conservation terms

and their measured level of awareness. This is based on a fundamental educational and psychological premise.

- b. That there would be no significant differences in the levels of awareness of male/female, urban/rural or English/Afrikaans pupils. This is based on the assumption that;
  - i. The sample group is a fair reflection of the target group for each of these sub-groupings.
  - ii. Culturally, the target group is relatively homogeneous.
  - iii. The vast majority of the target group would have experienced a similar, though not identical, exposure to the formal education process.
  - iv. Within the target group there is regular and easy social and cultural contact and cross-fertilization of ideas.
  - v. The questionnaire presented to the sample group is not culturally biased.
- c. That teachers have a potentially major role to play in the creation and development of environmental and conservation awareness but that they generally fail to fulfill this potential. This is based entirely on personal observations and experience. The view is held that not only are teachers generally unwilling to experiment with new ideas and techniques, but are generally unwilling to expose either themselves or their pupils to direct environmental experiences with which they are unfamiliar.

### 1.5 The concept of evaluation

As the major exercise of this study is an evaluative one, the term requires some clarification. Following Planchard (1968) the general meaning of the term evaluation "implies the idea of judgements and basic decisions based on the synthesis and analysis of diverse data" (quoted in Maldague, 1976, p.193). Referring to environmental education Maldague (1976, p.193) develops the argument further by pointing out the necessity of evaluation as a measure of "the deep effect of this education on the level of reasoning, on behaviour and on perception" and stresses the importance of taking variables into account if the assessment is to achieve a high level of reliability. He also sounds a note of warning:

"If it is true that the performance of students is a function

of the quality of teaching, including the value of textbooks and the capabilities of the instructor, then the general improvement of these performances cannot be realized without a constant effort to perfect the basic tools of evaluation."

Writing on national assessment in the United States, Fair (1974) suggested that any educationally evaluative exercise should seek the answers to: what people should be learning, what they should be achieving and the extent to which they are doing so. Bennett (1973) also saw evaluation as applied to environmental education devolving upon three basic questions i.e.

- a. What kinds of environmental education learning experiences can be evaluated?
- b. What outcomes of these learning experiences can one look for?
- c. How can the extent to which these outcomes have been achieved be determined?

The criteria proposed by these two writers serve primarily as an heuristic model for evaluative comparison rather than as definitive guidelines. In following the concern of how much the subjects of the study know and the extent to which selected factors have influenced their knowledge Bennett's three points are in essence synthesized. In the case of Fair's suggestions, this study, in the examination of her third point, both assumes answers to and pre-empts answers for the first two points. Thus in a sense, the extent to which these objectives are achieved will provide an evaluative yardstick of the study itself.

#### 1.6 Literature relating to evaluation in environmental education

While the concept of evaluation in environmental education has received some attention in general and philosophical terms, remarkably little empirical or statistical work has been done. Where this has occurred the tendency has been to concentrate on relatively small areas, often with the purpose of eliciting general principles rather than for the provision of baseline data. A pioneering example is the work of Maloney and Ward (1973), who on the basis of a 10-point scale on ecological attitudes and knowledge designed to test verbal versus actual commitment, concluded that

"... most persons have a relatively high degree of verbal commitment and affect, with lower levels of actual commitment and knowledge.



In colloquial terms, most people say they are willing to do a great deal to help curb pollution problems and are fairly emotional about it, but, in fact, they actually do fairly little and know even less." (p.585).

A revised and refined version of their work (Maloney, Ward and Braucht, 1975) corroborated this conclusion explaining that our frequent failure to live up to the environmental values we preach is a result of habits, social pressures and norms, environmental constraints or simply aspects of our personality which divert good intentions.

Other examples of evaluative work are Dispoto (1977), who suggested that a person's actual knowledge of the environment would be the best predictive measure of his attitudes, and Smith (1976), who in very broad terms explored the possibility of attitude changes being the result of increased knowledge. This line was also pursued by Barrus-Bammel (1978). Knapp (1972) examined and evaluated the potential role of the teacher and the school in environmental education. Further studies relating to environmental knowledge and attitudes are those of Kleinke and Gardner (1972), Cohen (1973), Comber and Keeves (1973), Hounshell and Liggett (1973), Shortle (1976) and Linke (1977).

Huckle (1980a, p.6) in reviewing evaluation in environmental education in general and referring to Maloney and Ward in particular, suggests that the available evidence indicates that the teacher can often overcome environmentally inhibiting factors leading to conflict between verbal and actual commitment in pupils by

"... identifying key figures who provide models of sound behaviour, by encouraging pupils to perceive themselves as 'doers', by linking their behaviour with pleasurable feelings, and above all, by spelling out how, when, and where a pupil can behave in the desired way."

The writer's experience with pupils and especially 'wildlife clubs' concurs fully with these sentiments.

Limited empirical research has been carried out by Bowman (1975) and Morrison, Moeller and Benjamin (1975). Bowman's work was based on the responses of American College students to a limited number of environmental topics while Morrison et al. carried out a similar survey on a small number of primary school pupils in Washington D.C. Some of the potentially most significant empirical research to date remains as yet unpublished in the form of Ph. D. theses in the United States and a

survey in Australia but are known only through reference by other authors. Both Perkes (1973) and Bohl (1976) have analysed the environmental attitudes of tenth and twelfth grade pupils in the United States, Bohl in 22 states and Perkes in 11. Evers (1975) examined environmental knowledge and beliefs among a wide cross-section of tenth grade pupils in Australia. The detailed results of this research have not been available to the writer but in general terms they have been recorded by Richmond and Morgan (1977, p.88) as "strikingly similar to the response patterns observed "in their own research — probably the most significant published material on evaluation in environmental education available anywhere in the world.

The report of Richmond and Morgan (1977) is based upon an unpublished doctoral thesis by Richmond entitled A Survey of the Environmental Knowledge and Attitudes of Fifth Year Students in England. Due to printing and other delays it was not possible to obtain a copy of this before embarking on the survey carried out in Natal in August and September 1978 and it was thus not consulted in the research design. The document is however a milestone in the field and, as in the cases of Bohl, Evers and Perkes, its subjects are in the approximately 16-17 year old bracket. Briefly summarising their report Richmond and Morgan (1977, p.12) pertinently conclude that:

"Although relatively few studies have been conducted relating to environmental knowledge and attitudes, some patterns appear to be evident. For the most part knowledge about environmental problems and issues is rather limited, while expressed attitudes tend to be quite positive. Although it does not hold true in all cases, most studies indicate that boys have greater environmental knowledge than girls; however sex differences in attitude toward the environment are not readily apparent. Significant correlations between environmental knowledge and attitudes have also been reported, with conceptual knowledge correlating with the affective component more strongly than factual knowledge."

As far as contemporary research in the field is concerned, Dr. R.W. West\*, to whom a visit was paid in June 1978, is currently involved in curriculum development relating to environmental education. The study is concerned with the description and analysis of current practice as a preliminary step toward the establishment of guidelines for future

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action, part of which would be methods of evaluation. Evaluation per se was not mentioned in the seven major objectives of the research (West, 1975). R.F. Morgan is reported by the Council for Environmental Education to be surveying the attitudes of American college students. The IUCN Commission on Education, which the writer visited in London in July 1978, was unable to provide any information of empirical evaluation done or being done in Eastern Europe or the Soviet Union, while D. Aldridge\* of the IUCN, consulted in June 1978, declared that he was not aware of any research taking place in Europe. There is no evidence of this type of study from Africa, Asia or South America, a fact corroborated by the Education Division of the World Wildlife Fund (M. Boulton, pers. comm.\*\*). Indeed in an extensive tour through the United Kingdom in 1978 it was found that although there was a widespread recognition of the need for both evaluative studies in general and empirical evidence in particular, with the exception of the works quoted, this had not yet been translated into actuality. The researcher is likewise not aware of a single example of evaluation of any form of environmental education in South Africa, except in the most general and subjective terms. No empirical or statistical work appears to have been done and there has been no attempt to measure whether what is being taught, in conservation terms, is 'getting through', having a 'lasting effect' or being interpreted correctly.

The English language journals and publications in which one may on occasion find references to current evaluative work on environmental education are:

REED - Review of Environmental Education Developments (U.K.)

BEE - Bulletin of Environmental Education (U.K.)

Journal of Environmental Education (U.S.A.)

American Psychologist

Environmental Education (U.K.)

The Ecologist (U.K.)

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- \* D. Aldridge, Assistant Director (Conservation Education), Countryside Commission for Scotland. Battleby, Redgorton, Perth PH1 3EW. Also a member of the North Western European Education Committee of the IUCN.
- \*\* M. Boulton, Director, Special Project for the Promotion of Conservation Education. World Wildlife Fund, Brocklebank, Butts Lane, Woodmancote, Cheltenham, Gloucestershire CL52 4QH, England.

Occasional publications of UNESCO, UNEP and the Council of Europe  
IUCN Bulletin.

Thus, in summary, this research pretends to be no more than a preliminary survey to provide, in the White South African context, a baseline for further surveys and research. Evaluation will be the ultimate determinant of the extent to which any programmes relating to environmental awareness become incorporated into the curricula of our education systems. As Maldague (1976, p.200) notes:

"Psychologically we tend to repeat those activities which are satisfying, which meet our needs. Often this judgement is made on a 'gut feeling', but there are those who need to be convinced by a standard of measurement based on hard, objective data."

## CHAPTER 2 CONCEPT, DEFINITION AND DEVELOPMENT OF ENVIRONMENTAL EDUCATION

### 2.1 The problem stated

Ecology has been broadly defined as "the science of the mutual relationship of organisms with their environment and with one another" (Monkhouse & Small, 1978, p.102). If one applies Hirst's (1965,1974) epistemological arguments, ecology, like geography, would qualify only as a 'field of knowledge', not as a discipline. This would be because its concepts are not indigenous but borrowed from several of the primary 'forms of knowledge' such as biology, geology, physics, chemistry etc. The philosophy of the nature of knowledge which this view represents would however not be agreed upon by all philosophers and would in fact be diametrically opposed to the views of some environmental philosophers such as Hettner (1927) and more recently Graves and Simons (1973). Without delving any further into the realms of epistemology, this argument illustrates something of the diversity of notions as to the nature and meaning, and thereby the scope and concern, of ecology.

It can therefore be argued that it is inevitable that any relationship of this 'field of knowledge' to any other 'field' or 'form' must carry with it some of the ambiguity and uncertainty attached to the parent term. This is particularly so when the attachment is to another 'field' such as education, which itself eludes definition. That 'education' for or about ecology, and axiomatically the environment, must by nature be highly eclectic is also self-evident, thus compounding the difficulties facing all attempts to define or even delineate some of the terms in common use.

The word 'environment' itself poses something of a problem in that although it normally denotes immediate surroundings, the term has acquired a more specialised meaning in ecological usage to describe the sum total of all the external conditions which may influence any organism, including man. In conservation circles the word is usually used to describe the human environment in this wider sense but with the emphasis on its natural resources (Pritchard, 1975). Some writers such as Wheeler (1970, 1975, 1976), Martin (1969a, 1973, 1975) and Carson (1973, 1977, 1978, 1980) have over the past decade consistently stressed the need for the concept

of environment to move away from being equated merely with its 'natural' component and to include the built or man-made environment. This concept of the total complex of inter-relationships making up the physical, biological and social surroundings is now widely accepted. (UKDOE, 1970; USOEE, 1970; Cerovsky, 1971; Nicholson, 1972; Martin, 1975; Hughes-Evans, 1977; UNEP, 1977; Withrington, 1977; NAEF, 1978; Amadou-Mahtar M'Bow, 1980; Tolba, 1980; Pederson, 1981).

Assuming that there is general agreement on the meaning of education it would seem logical to refer to any educational philosophy or programme intended to increase or promote sensitivity, knowledge or values about the environment as 'environmental education'. In practice however it is doubtful whether a statement like this would find more than at most a qualified acceptance. To attempt to define environmental education on this simplistic level would evoke strong opposition.

## 2.2 Environmental education

The term 'environmental education' covers a multitude of meanings and intentions. To the conservationists it is usually concerned with instilling an awareness of the value of natural resources for man's overall welfare, cultural and aesthetic as well as material, and of the necessity for their proper management and conservation. To the educationists, environmental education may or may not incorporate this concept, but it will usually include the idea of using the environment for education or skill development. Between these two stances is a wide spectrum of opinion on what constitutes environmental education, so much so that despite the attention devoted to it by numerous authors and several international gatherings, among them those at Carson City, Nevada in 1970, Belgrade in 1975 and Tbilisi in 1977, a universally acceptable definition has so far proved elusive. There are several reasons for this state of affairs:

- a. There is as yet no unifying environmental or educational philosophy underlying the diverse ramifications of the world, or even national environmental education movements. The interests of these movements moreover extend right across the educational spectrum from pre-primary to tertiary level. What was stated by the Council for Environmental

Education in 1970 remains equally true today; "... it is clear that different people mean different things by it [environmental education], and also that some of those who use it are not really certain what they mean" (quoted in Wheeler, 1975, p.9). South Africa is no exception in this regard.

- b. While there is general agreement (UNESCO, 1968; Martin, 1969a, 1969b; Lines & Bolwell, 1971; Carson, 1973, 1977, 1978; Wigston, 1977) that environmental education should take place both within and outside the formal education system, extensive controversy exists over its status and function in formal education and its overall importance outside of it. Confusion also arises from the tendency for adherents of various disciplines to appropriate the word 'environmental' for their own subjects whether this be archaeology, planning, history or sociology. Worse still, some still think exclusively in terms of 'natural' environments and others only of urban or man-made environments (Wheeler, 1975).
- c. The concept is bedevilled by a number of related or near-synonymous terms among the most common of which are 'conservation education', 'conservation awareness', 'environmental awareness' and 'outdoor education'.

In keeping with this vaudeville approach environmental education has, amongst other things, been described as 'a goal of education' (NAEE, 1976), 'a process' (Bennett, 1973), 'a subject' (Carson, 1973), 'a field of study' (Martin & Turner, 1972), 'a medium for skill development' (Watts, 1969; Schools Council, 1972b; Reid, 1974; Sandford, 1981), a 'way of life' (Selby, 1970), a 'style of education' (Carson, 1978; Pederson, 1981) and the 'key to the future' (Hughes-Evans, 1977). To some the term is synonymous with 'conservation education' or 'countryside education' or even a modern form of nature study. Others see it as an "approach to education which helps to develop individual potential and promotes a sense of responsibility for the consequences of personal and social actions" (Johnson, 1975, p.146). Still others follow the simplistic approach that pupils need only be taught about man's powers and responsibilities and his capacity to alter and recreate society (Arvill, 1967).

Those whose prime interests lie in the principles of conservation often conceive of it as including a built-in ethical component (Odum, 1971; Schools Council, 1972b; Burton, 1975), a view not confined to conservationists but which in recent years has included both clerics and moral philosophers (Shomon, 1964; Hardin, 1968; Allsopp, 1972; Montefiore, 1973; Strike & Egan, 1978; Sandbach, 1980). They frequently want the moral relationships of people towards the environment taught as part of the curriculum, on the basis that "such an ethic determines the way people use the land, air and other resources which in turn determines the quality of the human environment" (Martin, 1975, p.22).

More recently environmental education has been seen as the key to 'political literacy' in the sense of active public participation in decision making (Miller, 1976; Crick & Porter, 1978). Martin (1975, p.29) has argued that

"... environmental education does not ultimately have validity unless it also involves educating to change the human environment for the better by understanding on the one hand the political processes by which this can be done as 'participating citizens'; and on the other hand, as noted by the conservationists and other environmentalists, by acquiring an environmental ethic and a knowledge of the ecological basis of all life, on which value judgements about the environment can be based. Thus any definition of environment must take into account human and natural aspects of the surroundings we inhabit."

Similar sentiments have been amplified and widely disseminated by Ward & Fyson (1973) and through the Bulletin of Environmental Education (BEE). It is a view which sees society gradually moving from a formal representative democracy to a fully participatory one, in which people cherish their environment because it is theirs to take part in creating and conserving. Forbes (1974, p.10) attempted to synthesize the socio-political and 'natural' viewpoints by defining environmental education as

"... the study of the activities of people in relation to the physical world around them, and the study of the socio-political institutions (e.g. the statutory planning system) which regulates this relationship in the interests of society as a whole."

In spite of the oblique support given by the Maine Environmental Education Project (1973), at that time a significant contribution in the field, this approach has not yet gained wide acceptance, and is in fact opposed by the politically more conservative exponents of environmental education



who tend to see it more as a matter of applied fieldwork and practical ecology\*. Accepting that environmental education is directed towards the development of attitudes and behavioural skills in the areas of ecological knowledge and environmental decision making, the Project suggested that environmental education could most appropriately be defined as

"... a process aimed at producing a citizenry that is knowledgeable concerning the total environment and the role of man, able to participate in activities for maintaining and improving the quality of the environment while meeting human needs, and motivated to do so." (Quoted in Saveland, 1976, p.201).

From this definition it was argued, could be derived all the subgoals required for a comprehensive approach. Thus Johnson (1975, p.146) could note that:

"The use of the blanket term 'environmental education' to describe all the many activities involving the use of the environment for educational purposes has created many uneasy bedfellows and any discussions on the subject can provoke conflicts between groups with similar basic aims but differing emphases."

Nothing could be truer of South Africa in 1981 — a situation amply reflected at the 1980 UNISA (University of South Africa) Workshop on Outdoor Education, to which later reference is made.

More recently several writers and institutional reports (Carson, 1980; Chiappo, 1980; IBRD, 1980; OECD, 1980; Tolba, 1980; Womersley, 1980; Baines, 1981; O'Riordan, 1981) have drawn attention to the relationship between environmental education and the economic and social circumstances of the 'third world', effectively the large majority of the world's population. This awareness, sometimes embodied in the term realconserve, argues that in order to place environmental education in its logical context, it must be recognised that the task cannot be reduced to problems of industrial hygiene and the conservation of species, even though this might be part of it. The real issues to be dealt with are those causing the day to day hardship and death of people all over the world. The world's environmental problems are seen ultimately to reside in the structure of economic, industrial, political and military power designed

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\* This is a view seldom seen in print but which was frequently expressed to the writer in Britain and Europe in 1978, particularly at Field Study Centres.

to serve the interests of profit and the accumulation of wealth. A new ecological ethic is called for in which, not only is there to be a new world economic order based on a more equal distribution of wealth and the rational exploitation of resources, but which recognises man as an integral part of nature, living in harmony with his environment. O'Riordan (1981, p.4) summarises this view:

"Behind all the reasoning is the spectre that any attempt at continued economic growth in its current wasteful and highly inegalitarian form will not only result in very real and imminent resource scarcities, but will necessarily lead to environmental destruction and serious poverty and social hardship. The worst consequences will fall disproportionately upon those who are least able to help themselves, and whose indigenous abilities to cope with resource scarcities and environmental stress are already being eroded by forces mostly beyond their control, and whose voices in the halls of political power are either not heard at all or are extremely faint."

### 2.3 The IUCN definition

By far the most frequently referred to definition of environmental education is that of the IUCN (International Union for the Conservation of Nature and Natural Resources). Worked out at the first 'International Working Meeting of Environmental Education in the School Curriculum' in Nevada in 1970, it was based on the existing statements of Horn, Brennan and Brandywine (Cerovsky, 1971, p.17). As adopted it reads:

"Environmental education is the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture and his biophysical surroundings. Environmental education also entails practice in decision making and self-formulation of a code of behaviour about issues concerning environmental quality." (IWMEE, 1970; IUCN, 1971b).

The conference further agreed that environmental education was a science-orientated, multi-disciplinary subject where most, if not all school subjects could and should be incorporated.

Despite widespread acceptance (Mellowes, 1972; Reid, 1974; Carson, 1978) and application (NAEE, 1976) of the principles embodied in the definition there has nevertheless been a strong and consistent criticism of its approach. Terry (1971) stressed that the process could occur in all educational situations, scientific and humanistic, while Dartmouth's

working party countered the science-centred approach by emphasising the awareness component, with art providing an important avenue of approach (HMSO, 1972a). They also felt that ethical aspects required greater emphasis. HMSO (1972b), recognising that the 1972 Stockholm Conference on the Human Environment, despite its now legendary political squabbling, was largely concerned with the bio-physical environment, proposed a revision of the definition to include a series of complex social and cultural relationships that effect human behaviour and attitudes. This has not as yet taken place.

In the intervening years calls for a social science content in environmental education and the expression of the view that it should go hand in hand with the exercise of citizenship, have become increasingly articulate (Chippendale, 1973; Wheeler & Waites, 1976; Carson, 1978; Crick & Porter, 1978; Huckle, 1980a; IUCN, 1980), while BEE, under the guidance of Colin Ward and Tony Fyson, has broadened the basis of public support upon which, morally, such a view rests. In Britain, much of the success of this movement has resulted from the publication in 1969 of the Skeffington Report on Public Participation in Planning (HMSO, 1969). In South Africa this view appeared in print for the first time in the document Policy and Strategy for Environmental Conservation in South Africa (WLSSA, 1980a) and has already evoked sharp verbal criticism.

A potentially viable alternative to the IUCN definition is that embodied in the United States Environmental Education Act of 1970. In the United States Senate Report explaining the Act environmental education is defined as

"... an integrated process dealing with man's inter-relationship with his natural and man-made surroundings, including the relation of population growth, pollution, resource allocation and depletion, conservation technology, and rural and urban planning to the total human environment. Environmental education is related to a study of the factors influencing ecosystems, mental and physical growth, living and working conditions, decaying cities and population pressures. ... environmental education is intended to promote among citizens an awareness and understanding of the environment, our relationship to it, and the concern and responsible action necessary to assure our survival and to improve the quality of life." (Quoted in Martin & Turner, 1972, p.ix).

This was an attempt to accommodate two schools of thought, one emphasising environmental education as a process and the other stressing content, but

despite widespread publicity and acceptance within the United States, this definition is seldom referred to in non-American writing. The reasons why this should be so are not clear but are possibly rooted in the IUCN's strong European base. A useful comment synthesizing much of what has been said concerning the definition and concept of environmental education comes from Wheeler (1975, p.18) who reminds us that:

"Undoubtedly the plurality of environmental education is both its strength and its weakness; but many questions concerning its definition and its curriculum objectives have to be answered if progress is to be made towards devising coherent and relevant programmes encompassing all age groups and ability levels."

In the final analysis it is what individuals make of their own situation that counts.

#### 2.4 The status of environmental education

Views on methods of teaching environmental education also vary widely. Numerous writers have argued both for and against its existence as a separate subject or discipline with the weight falling on the side of the inter-disciplinary approach (Shaw, 1976\*; NAEF, 1978). The conceptual differences between a subject and a discipline have been covered elsewhere (Graves & Moore, 1972) and need not concern us further, but as Saveland (1976b, p.4) points out "the compulsion to define environmental education has at times taken on the appearance of an attempt to establish the boundaries of a discipline." "Perhaps", he observes, "it is related to an underlying psychological need for structure and order in our lives." Further support for this view is to be found if one applies King and Brownwell's (1966) method of identification of the isomorphic features of a discipline which suggest that despite the widely agreed upon characteristics of environmental education in transcending disciplines, it is, through the definition process, assuming several characteristics of a discipline.

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\* By way of example: "When thirty-eight Australian educators were asked what they considered to be the major areas of need in environmental education, the four most important needs were shown as - teacher education (92%), materials (74%), resource and information centres (68%), and field study centres (68%). It is interesting to note that only 5% saw it as a new subject." (Shaw, 1976, p.69).

It is also interesting to observe that in many ways and because of its eclectic approach, environmental education suffers from many of the same advantages and difficulties which geography did in its early days (Naish, 1972). In this spirit Tanner (1974) reminded us that whereas environmental education may range across a diversity of topics and subjects it must not lose its central focus, which is the maintenance for present and future generations of a healthy and ecologically varied planet. In practice environmental education is taught in a wide variety of ways ranging from Carson's (1973) A-level syllabus for environmental studies to a complete non- and multi-disciplinary approach frequently bordering on the ad hoc. One of the most interesting and innovative methods of all is in Zambia where the topic is unobtrusively part of the new primary school language readers. Thus whether the approach involves 'style of education' or separate subject, what really matters is that the concept of environmental care should become a part of modern cultures, a view espoused by the IUCN. Undoubtedly some methods will be more operationally effective, but how these relate to cultural differences there is as yet little evidence. Perhaps, as Watts (1973) suggests, we should look for more of the answers in the area of child development rather than in epistemological acrobatics and semantic hairsplitting. The question of the relationship of environmental education and more particularly conservation education, to individual school subjects, especially allied ones such as geography, biology and agriculture, is a topic to which we will return in later chapters.

## 2.5 The relationship of environmental education to 'conservation' and 'awareness'

It is appropriate to examine some of the terminology either closely related in meaning to or synonymous with environmental education. Reference was made to conservation in Chapter 1 as being the 'wise use of resources'. Although the wide acceptance of this simple dictum (WLSSA, 1980a) allows us to use it as an operational definition, attention must be drawn to the fact that the term, while essentially keeping to this spirit, has also been more elaborately described. Nicholson (1972, p.277) for example, believes it to be as "all that man thinks and does to soften his impact upon his natural environment and to satisfy all his own true needs while enabling that environment to continue in healthy

working order" while Burton (1975, p.43), taking a broader view, defines it as "the management of the environment for the benefit of the community as a whole to provide life of a high quality". The word 'community' is here used in the ecological sense to mean all living organisms, including man. It cannot be ignored that neither of these widely quoted statements make direct reference to the built environment and in fact a definition of conservation which does so is difficult, if not impossible, to find.

More important is the way in which the meaning of the word 'conservation' has evolved in public perception. From being confused with the earlier notion of 'preservation' (implying the 'non use of') usually identified with middle class or country as opposed to urban interests, the term is now a household one, although it is not always fully understood. It is increasingly applied in suffixal form to any item or product of which supplies are relatively difficult to come by. Burton (1975, p.43) sums this up when he declares that:

"To advocate conservation used to be somehow unpatriotic, one was trying to erect obstacles on the motorway to the new affluent Jerusalem; or worse, it was a middle class conspiracy to prevent the less fortunate benefiting from the general rise in consumption of the world's riches. Now conservation is becoming respectable. Soon it will be essential!"

He does however sound a warning on the discrepancy between what people know to be sound conservation practice and what they themselves do in fact practise; a point to which we will return in the discussion of the research results where the sample group's understanding of the term 'conservation' is also analysed.

Conservation education has tended to be used by nature conservationists as a synonym for environmental education and was in fact the term used by the IUCN from its inception in 1949 until the mid 1960's when it was officially replaced with environmental education. Examination of published material shows however that although gradually being superseded, the term continued to be used, especially in the USSR and Europe, where even IUCN publications still bore it (IUCN, 1968a, 1968b, 1970a, 1971a, 1972a). Reasons advanced for the change were mainly socio-political. As Phillips (1972) pointed out, "conservation interpreted as by, for and on behalf of the middle classes made a poor motto for a movement which was

supposed to be of concern to the whole of mankind" (quoted in Martin, 1975, p.21). Carthy (1972) observed too that a considerable danger had lurked in the suggestion that everything should be subservient to 'conservation' as it was popularly understood. The term 'environment' conveyed a much wider meaning.

Conservation awareness is a term in common use in South Africa, the United States and Australia, although seldom seen or heard in Europe. In Southern Africa the major organisation involved in environmental education (in terms of the IUCN definition), the Wildlife Society of Southern Africa, calls its educational division the 'Conservation Awareness Programme'.

Hurry (1978, p.1), the only South African writer to have attempted a definition of conservation awareness, conceptualises rather than defines it in the following terms:

- " i. Conservation Awareness implies that the individual is aware of the natural and man-made environment of which he is part and that he sees his places of work, residence and recreation as part of the fabric of his own ecosystem. Most important is that he should see himself as a living part of, and interacting with, the ecosystem.
- ii. The individual is aware of the natural resources upon which he relies either directly or indirectly, and that he has some idea of the implications of finite and renewable resources.
- iii. The awareness that an individual has must stimulate him to positive conservation action in his daily life. He is committed to caring for his environment and its resources. He must have a conviction of the individual responsibility for the health of the land. Health is the capacity of the land for self-renewal. Conservation is the individual's effort to understand and maintain this capacity.
- iv. The above implies that a Conservation Awareness Programme must be aimed at changing attitudes and behaviour patterns.
- v. Conservation Awareness is very different from a more general 'environmental awareness'. The latter term separates man, as an onlooker, from his environment, the former keeps him as an interacting part of it."

Such an approach is in harmony with the notion that conservation itself, like ecology, is multi-disciplinary by nature and eclectic in approach and, with the exception of point (v) the writer is in total agreement with Hurry's view. In the case of (v), while the need for such a distinction is appreciated, the basis on which it is done appears to be entirely arbitrary and is in conflict with the researcher's own concept

outlined below.

In South Africa the terms 'environmental education', 'conservation education' and 'conservation awareness' have until recently tended to be used loosely and interchangeably with little attempt at clarification or definition by those involved (SARCUSS, 1967; WLSSA, 1976; Council for Habitat, 1977).

Environmental awareness has been used by the Council of Europe (1976a) as closely related to environmental education but without defining the former term. It is loosely described as an attitude to environment in relation to needs for survival of which surely the same could be said for conservation awareness. Ittleson *et al.* (1974, p.7) in viewing 'environmental awareness' from a behavioural stance declare that "... it means, simply, that for purposes of study and investigation, we perceive our role vis-à-vis the environment in terms that are quite different from anything that existed before. Out of this awareness a new set of attitudes and values is emerging". They then go on to list some of the aspects of the environment, physical, social and psychological about which we become aware, and finally declare that environmental awareness "presents us with a new man, environmental man, whose relation to his world is uniquely different from that of his predecessors throughout history". This interpretation of environmental awareness has received strong support from several 'third world' writers on the subject (Chiappo, 1980; Tolba, 1980; Womersley, 1980).

In an attempt to synthesize and make order out of the muddle of terminology the following model is proposed:

- a. That the terms awareness and education be differentiated in meaning and usage as follows;
  - i. Awareness is having knowledge or consciousness (Longman's Dictionary of Contemporary English, 1978); it is compounded of factual knowledge, conceptual knowledge (including ethical aspects) and the attitude resulting from these. It may be termed 'high' or 'low' depending on the degree to which it is in harmony with its object of intention.
  - ii. Education is a process which among other things is aimed



at achieving awareness.

- b. That a clear difference be made between environmental and conservation i.e.:
  - i. Environment, following Monkhouse and Small (1978, p.105), "is the whole sum of the surrounding external conditions within which an organism, a community or an object exists". 'Environmental' is the adjectival form.
  - ii. Conservation is the attitude of using the environment wisely by exercising careful control and management.

This permits the delineation of the following compound terms:

- a. Environmental awareness; the level or state of awareness about the environment including the need for conservation.
- b. Environmental education; the process of achieving environmental awareness. It must therefore include a conservation component but is not composed exclusively of it.
- c. Conservation awareness; the level of awareness about how to use, or treat the environment. It is therefore a part of environmental awareness.
- d. Conservation education; the process aimed at achieving conservation awareness. It is therefore a part of environmental education.

This delineation allows us, in accordance with the aims stated in Chapter 1, to work within the broad frameworks of environmental awareness and environmental education while being more specifically concerned with the measurement of conservation awareness. Where appropriate, reference can then be made to conservation education as a means of achieving conservation awareness. Put another way, we are measuring results of the past processes of environmental education and conservation education to see what they have achieved and in so doing will be in a position to comment on these processes for their value, success or otherwise.

## 2.6 The relationship to outdoor education

A less tractable problem arises when the term outdoor education is brought into the arena, as is frequently the case in South Africa. Parker and Meldrum (1973) in attempting to define it, list no fewer

than 21 virtually synonymous terms including 'environmental education', 'conservation education' and 'environmental studies'. Reference to the definition put forward by the [British] National Association for Outdoor Education serves only to confuse the matter further: "Outdoor Education is a means of approaching educational objectives through guided direct experience in the environment, using its resources as learning materials" (Parker & Meldrum, 1973, p.10). One hears of environmental education and conservation education spoken of in almost identical terms. Liebenberg and van Z. Spies (1979) use the term open air education (translated from Afrikaans 'buitelugopvoeding') synonymously with outdoor education but fail to define either term.

In the South African context Clayton (1980, p.13) has up to now made the most comprehensive attempt at defining outdoor education. Quoted in full his proposal reads:

"Outdoor education is an interdisciplinary and integrative method of teaching which should be an integral part of the educational system, and is based on the principle that the teacher should use the outdoors as a classroom, to lead the pupil into primarily affective, but also cognitive, psychomotor and other valuable learnings and skills, which cannot be as effectively achieved in the indoor classroom. It is not a subject, nor is it just education out of school, but relates to man's love of, interest in, involvement in, enjoyment of, understanding of, wise use of, care of, as well as concern for, the environment, as a product of God's creative power, expressed through active participation in the solving of its problems."

It has however so far failed to gain acceptance and at the 1980 UNISA Workshop on Outdoor Education where it was first put forward, over seventy amendments were suggested. A large part of the problem lies in confusion with 'environmental education', which Clayton relegated as subservient to 'outdoor education'. The question arose as to which was part of the other and where priorities should lie in determining objectives, a situation not helped by the assertion that "While environmental education has not yet developed into a definite subject discipline, but is regarded as an interdisciplinary approach; it is not, like outdoor education, a teaching method" (Clayton, 1980, p.15).

At least some of the disagreement and mutual antagonism which exists in this field in South Africa is due to simple misunderstanding of the alternative view. In an attempt to reconcile partially these differences

the following diagrammatic model (Figure 2.1) was initially proposed by the writer at the 1980 UNISA Workshop referred to above. It will be noted that account is taken of the relationship of 'conservation education' to 'environmental education' as well as the latter to 'outdoor education' and both to the wider compasses of education and recreation.

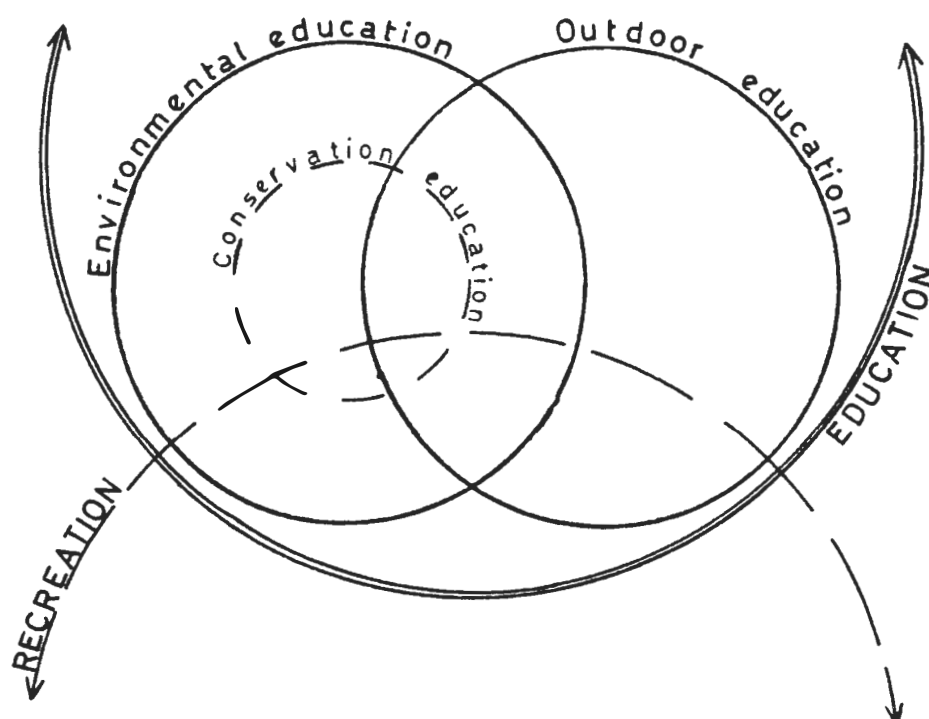


FIGURE 2.1 DIAGRAMMATIC MODEL ILLUSTRATING THE RELATIONSHIP OF ENVIRONMENTAL EDUCATION TO OTHER FIELDS OF EDUCATION AND TO RECREATION

Aims and goals in environmental education in general have been dealt with in considerable detail elsewhere (Colton, 1972; Morgan, 1972; Carson, 1973; Aldrich & Blackburn, 1975; Martin, 1975; Pritchard, 1975; Engelbrecht, 1976; Hurry, 1978; IUCN, 1979, 1980a; WLSSA, 1980a and at the Tbilisi Conference in 1977) and our purpose here would not be served by any further examination. Suffice it to say that they are as diverse in purpose and concept as the attempted definitions which have been overviewed. It is important however to draw attention to two aspects of the South African situation.

One of these is an area of conflict arising from the somewhat differing stances normally taken by the 'environmentalist-conservationists' on the one hand and educationists on the other. South African environmentalists often tend to see environmental education as primarily for the environment while educationists often view it, if they do at all, as education using the environment. They frequently fail to recognise the importance of environmental conservation to the future, for which they claim to be preparing the nation's youth.

The other aspect is where priorities lie or are seen to lie, and this is to some extent a political issue. The more conservative elements of our society tend to place the emphasis on 'outdoor' as opposed to 'environmental' education. The core of this arrangement is usually seen to revolve around such attributes as physical fitness, group effort and achievement, character development, culture and religion with a general tone that is overtly patriotic and sometimes political. The conservation ethic is not neglected but tends to occupy a peripheral position. Apart from the religious component it is a stance also found in the USSR and parts of Eastern Europe and the United States. In South Africa this view finds reflection in, for example, the 'Veld Schools' of the Transvaal, the 'School in the Wilds' at Villiersdorp and to a lesser extent the Land Service Movement. This approach may also be seen in a modified form in the youth movements in the homelands and national states of South Africa\*.

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\* Throughout the text 'national states' are defined as those areas which have opted for a degree of independence from South Africa. At present (December 1981) they are Bophuthatswana, Ciskei, Transkei and Venda. 'Homelands' are those areas which are presently partly self-governing i.e. KwaZulu, Gazankulu, Lebowa, KwaNdebele, QwaQwa and KaNqwane. They are based upon Black ethnic groupings. The term 'provinces' applies to the four administrative provinces (Natal, Cape, Transvaal and Orange Free State) in which local councils exercise limited control over issues such as education and conservation. The division of the provinces is based upon traditional and historical settlement patterns of Whites. The term 'greater South Africa' is used to include the national states, homelands and provinces.

The viewpoint generally espoused by the 'less conservative' school of thought tends to be more towards a central core of conservation ethics, aesthetics and individual experience, with physical and character development occupying the periphery. At times the religious aspect may occupy the central core and at times the approach may be totally deistic. Patriotism, where the issue arises, is inclined to be seen more in the soil than in the flag. It is a view common in Western Europe, North America and Australasia. In South Africa it tends to have its spiritual home in Natal, although it is not confined to that province. The local praxis of this view is to be seen in institutions such as the ACE Programme, the Wilderness Leadership School and the Umgeni Valley Project. We should note however that in the South African context the picture outlined applies almost exclusively to Whites, as at present it is among that group that such issues have been debated. Black South Africans insofar as they are involved at all, find themselves represented in both categories, although there are signs that an indigenous line of thought may be developing. It is a field about which little is known at present.

Apropos of both the above schools of thought it would be true to say that until there is agreement at least to respect as well as to recognise differences, people of divergent views will continue to pull in different directions to achieve not only different, but often similar goals. One might be forgiven for agreeing with Saveland (1976b) that the search for definition, goals and objectives sometimes comes close to the limits of futility. It certainly does consume a great deal of time and effort which might be more effectively spent elsewhere, but the fact must not be lost sight of that practice proceeds from declared principles, aims and goals and that the planning and implementation of any scheme of environmental education must have a well-defined basic framework and philosophy. Few would pretend that the search for a universally acceptable definition of any of the terms which have been discussed has been conclusive, nor is there any reason why it should be so, as long as the search does not become an end in itself.

Having established the parameters and interrelationships of the terminology with which we are working, it is now appropriate to complete the contextual picture. This can best be achieved by reviewing briefly the historical development of the international environmental education movement as a prelude to examining the current environmental education

position in South Africa.

## 2.7 The origins and development of environmental education

The modern concept of environmental education had its roots in the nineteenth century at a time when, as Wheeler (1975, p.2) observes, "the Industrial Revolution had caused an unprecedented alienation of Man from Nature and the disruption of [Western] civilisation's formerly unified cultural milieu". In addition, Darwin's Origin of Species, published in 1859, had brought into question not only the possibility of man's origins but of his entire relationship with the rest of the living world. Reactions to the changing world ranged over a broad spectrum. Romantics, such as Wordsworth, who in mourning the passing of the rustic scene wrote:

"Is then no nook of English ground secure  
From rash assault? ...

Plead for thy peace, thou beautiful romance  
Of nature; and, if human hearts be dead,  
Speak, passing winds; ye torrents, with your strong  
And constant voice, protest against the wrong ...

Hear YE that Whistle? As her long-linked Train  
Swept onwards, did the vision cross your view?  
Yes, ye were startled; - and, in balance true,  
Weighing the mischief with the promised gain,  
Mountains, and Vales, and Floods, I call on you  
To share the passion of a just disdain."

(From On the Projected Kendal and Windermere Railway).

Educationists on the other hand such as Jean Pestalozzi, Friedrich Froebel and R.W. Emerson followed the example of Rousseau in advocating the importance of nature study in a child's education.

In a world being rapidly engulfed in mass production and widespread squalor, other disciplines also began to react and in so doing found areas of common concern. The pioneer sociologist, Frederick LePlay (1806-1882) considered the study of botany to be a significant aid in understanding the nature of society and the term 'ecology' was coined by the philosopher-biologist Ernst Haeckel in 1874. Added to this were the critical rumblings of English writers such as John Ruskin, William Morris and Herbert Spenser. On the other side of the Atlantic, H.D. Thoreau, John Muir and George Perkins Marsh were drawing attention not

only to alternatives to industrial despoilation and urban sprawl, but playing a pioneering role in the documentation of nature's wonders and man's impact upon them. Largely as a result of their efforts, 1872 saw the declaration of the world's first national park at Yellowstone. Another result of the momentum generated by these individuals, and their convert, Theodore Roosevelt, who espoused conservation as a major theme in United States policy making, was that conservation studies were introduced in American schools as early as 1908 (Clacken, 1956).

The major figure of the nineteenth century in terms of the actual practice of environmental education was Patrick Geddes (1854-1933), a Scottish professor of botany and student of LePlay sociology. Dissatisfied with school and university learning and teaching methods and appalled by Britain's spreading slums and conurbations, he dedicated himself to the improvement of both environment and education. Undoubtedly the founding father of modern environmental education, Geddes' strength lay in his holistic view and unlike so many of his contemporaries who were concerned only for the rural environment, he foresaw the importance and necessity of beauty and function in towns and cities. Wheeler (1975, p.4) goes so far as to express the view that "all the elements of the best of present day enlightened teaching were germinal to his thinking".

Geddes' philosophy found expression in the writings of educational theorists such as John Dewey, Sir John Adams and J.W. Adamson, who in their turn helped to ensure that during the interwar years of the twentieth century teachers were introduced to the idea that learning for young children at least took place through contact with the environment. What this in effect meant in many cases was a shift in emphasis from the use of abstract to concrete situations and the fostering of observations through nature study, a movement which did not however take place without some opposition and suspicion as the following American satire, published in 1904, illustrates;

"They taught him how to hemstitch, and they taught him how to sing,  
And how to make a basket out of variegated string.  
And how to fold a paper so he wouldn't hurt his thumb;  
They taught a lot to Bertie - but he couldn't do a sum.  
They taught him how to mould the head of Hercules in clay,  
And how to tell the difference 'twixt the blue bird and the jay,

And how to sketch a horsie in a little picture frame,  
 But, strangely, they forgot to teach him how to spell his name."  
 (Quoted in Curtis & Boulton, 1965, p.381 from; F.H. Hayward  
Pestalozzi and Froebel. Holland, 1904.)

A further major step was taken with the publication in 1938 of C.J. Cons and C. Fletcher's Actuality in the Classroom which dealt with the idea of bringing the environment into the classroom not only in the form of samples and specimens but as the postman, forester or conservation officer. This approach, far from competing with the 'nature' element in learning, complemented it.

The first half of the twentieth century also saw in both Europe and America a slow but steady increase in popular support for environmental causes, sometimes, as in the new USSR, finding expression in political ideology. An example in Britain was the formation in 1926 of the Council for the Preservation of Rural England which, despite its restricted aims, achieved pioneer status as a pressure group concerning itself with educational as well as with political activity.

The years of World War II proved to be an important period of incubation concerning plans for improving the environment and effecting environmental education. Gradually the terms 'amenity' and 'preservation' gave way to 'conservation' with its much wider implications of planning and management, a process made easier in Europe by the post war enthusiasm for socialism which swept that continent. In several European countries and in the USSR a commitment to environmental conservation was written into the constitution (Bauer, 1969; Mirimanian & Gladkof, 1969; Pritchard, 1969; Szczesny, 1969), and in many countries the late forties and early fifties saw the setting up of national parks systems with 'nature conservancy councils' to run them. There was also a mushrooming of support for private bodies and organisations in America, Europe and much of the British Commonwealth, both commenting on and exercising pressure on behalf of environmental issues including education. Examples included the 'Royal Society for the Protection of Birds' and 'The Council for Environmental Education' in Britain; the 'National Wildlife Federation' and the 'Audubon Society' in the United States; the 'Vereniging tot Behoud von Natuurmonumenten' in the Netherlands; the 'Gould League' in Australia and the 'Wildlife Society of Southern Africa'.



Coupled with this was a substantial increase in both the quality and circulation of environmental and conservation magazines and journals.

At about this time too the mass media began to support environmental issues, a process which in varying degrees has spread throughout the world and continues to this day. It is a matter of record too that much of the popular enthusiasm for environmental conservation has been due to the eloquence and persuasive leadership of its early media spokesmen such as Aldo Leopold, Sir Peter Scott, the Duke of Edinburgh and Prince Bernhardt of the Netherlands. Increasingly they have made conservation an international rather than a national issue. Environmental action groups sprang up in many countries where there had hitherto been little interest in environmental matters. Until then the 'environmental revolution' (Nicholson, 1972) had been largely a middle class concern but it increasingly exerted a new urban-proletariat influence with the roots of its thoughts not only in Geddes but also Kropotkin and Marx (Woodcock, 1974). The movement was also reinforced by another powerful factor; the growing interest and participation in outdoor activities ranging from mountaineering, sailing and canoeing to orienteering, camping and cross-country running.

By the mid 1950's the importance of education in environmental management was being widely proclaimed and for the natural environment at least, prospects looked promising. It was not however until the late sixties that similar enthusiasm for environmental quality in built-up areas began to emerge. Watts (1969) could in fact at the end of that decade observe with validity that in most cases the dominant feature of environmental education was still the naturalist element.

The International Union for the Conservation of Nature was formed in 1948, followed by its sister body, the World Wildlife Fund (WWF) in 1961. Both organisations have from their beginning regarded environmental education as an integral part of their function and indeed much of the environmental awareness which currently exists in the developed countries can be attributed to their efforts. Today the emphasis is increasingly on the underdeveloped parts of the world although the task is by no means complete elsewhere. One of the most important contributions to environmental education to come from these organisations, is the

prominence given to the concept in the World Conservation Strategy, published in 1980 (Allen, 1980; Boote, 1980; IUCN, 1980a) which embodies many of the principles of realconserve outlined earlier. Appearing in concert with this document was the South African equivalent, A Policy and Strategy for Environmental Conservation (WLSSA, 1980a).

From a series of national conferences on environmental education in a few countries, notably the United Kingdom and United States, during the sixties, there evolved in the seventies a series of international debates, conferences and workshops either on or related to environmental education and awareness. The value of these is not always agreed upon\* but in a world shrunk by rapid and efficient transport, no country or individual can afford to remain isolated. Some of the most important of these gatherings have been;

- 1967 IUCN seminar on Education at the University Level, Lucerne, Switzerland.
- 1968 UNESCO Biosphere Conference, Paris, France.
- 1970 IUCN International Working Meeting on Environmental Education in the School Curriculum, Carson City, Nevada, USA.
- 1970 European Conservation Year resulting from a 1967 decision by the Council of Europe led to several national and regional conferences and seminars.
- 1971 IUCN First European Working Conference on Environmental Education, Rüschtikon, Switzerland.
- 1972 IUCN International Workshop on Environmental Education, London, Canada.
- 1972 UN Conference on the Human Environment, Stockholm, Sweden.
- 1975 UNESCO/UNEP International Workshop on Environmental Education, Belgrade, Yugoslavia.
- 1977 UNESCO/UNEP Inter-governmental Conference on Environmental Education, Tbilisi, USSR.
- 1979 COUNCIL OF EUROPE International Workshop on Educational Approaches to Increase Public Participation in Urban Environmental Issues, The Hague, Netherlands.

In addition UNESCO/UNEP has been responsible for regular international

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\* For example, the writer found in Europe in 1978 widespread criticism, some documented, of the previous year's Tbilisi Conference.

meetings on a regional basis.

The most effective of these meetings to date, in terms of focusing attention on the economic, social and political realities of environmental education, have been the Stockholm Conference, the Belgrade Workshop and the Tbilisi Conference. From the latter two have also come the currently most widely accepted statements of principles on environmental education i.e. the Belgrade Charter on Environmental Education and the Tbilisi Declaration, detailed analyses of which have been covered elsewhere (Fensham, 1976a; Dyasi, 1977; Hughes-Evans, 1977; UNEP, 1977; NAEF, 1978; UNESCO-UNEP, 1978, USDHEW, 1978; Womersley, 1980).

Viewed in a broad perspective, post World War II environmental education has been characterised by three distinct areas of concern:

- a. An increasing emphasis on scientific knowledge about the environment. In terms of natural ecosystems the United States played the pioneer role and continues to make a major contribution. The research models developed in that country are now being emulated worldwide. The more recent awareness of the built environment and its complex interrelationships both within itself and with its rural surroundings, has its spiritual home in Europe. This is not surprising in a continent where 'wide open space' or 'wilderness' is now a comparative rarity.
- b. The transmission of both knowledge and attitudes about the environment to the public in general. Again much of the credit must go to Americans such as Aldo Leopold who brought into clear focus as one of the most important moral discoveries of our time, the ecological conscience — a belief which is centred in an awareness of man's true place as a dependent member of the biotic community. Rachel Carson's Silent Spring (1962) began the awakening of environmental consciousness on a world wide scale, while Ehrlich (1968, 1970) and Commoner (1970b, 1972) have as much as anyone, popularised ecology by bringing it to the attention of the world's ordinary citizens in a language they can understand (Hawkins & Vinton, 1973). Terry (1971) remarks that it is in fact no accident that in 1970 when other countries were just beginning the development of their environmental education programmes, the United States became

the first nation to pass an Environmental Education Act; an assertion which must however be tempered by the fact that general environmental despoilation has possibly been at its visually most dramatic in the USA and that environmental education programmes vary greatly in quality and quantity both within and between states.

In Europe the country which in many aspects of environmental education stands out from others, largely as a result of its own efforts, is the Netherlands. It is arguable that today it has the most environmentally literate population in the world. Other countries such as Australia, South Africa, Zimbabwe, Kenya and Chile have followed some years behind Europe, the USSR and the United States, while yet others such as India, Brazil or Venezuela have made minimal efforts in this direction (Doraiswami & Galushin, 1971; Eichler, 1971; Futehally, 1971; Boote, 1980; Chiappo, 1980).

- c. The third area of concern, again confined almost entirely to the USSR, Europe, United States and lately Australia, has centred around the status of environmental education at school level. Much time and effort has been taken up by the search for definition, aims, objectives and principles. The manner of approach (i.e. single-subject/inter-disciplinary controversy) has also enjoyed a great deal of attention, but the methods of transmission of values and knowledge have yet to come under the spotlight. Teacher training, possibly the most important aspect of all, has so far received only the most cursory attention.

## CHAPTER 3 THE SOUTH AFRICAN SETTING

### 3.1 Environmental conservation

The state of environmental conservation in greater South Africa has been covered in detail elsewhere (e.g. Clark, 1974; Edwards, 1974; Von Richter, 1974; Bothma, 1975; Taljaard, 1975; Grindley et al., 1976; Haacke, 1976; Meester, 1976; Siegfried et al., 1976; Skinner et al., 1977; Begg, 1978; Huntley, 1978; McLachlan, 1978; Noble & Hemens, 1978; Cloete, 1979; Grindley & Cooper, 1979; Hall et al., 1980; WLSSA, 1980a) and may be summarised as follows: Despite significant achievements in some fields such as ensuring the survival of individual species (e.g. the white rhino (Ceratotherium simum), and the high standard of conservation within the approximately 4,6% of the country designated as conserved areas\*, the overall picture is gloomy. Conservation of representative habitat types remains far behind the minimum necessary for a long term healthy environment. Some kinds of pollution are subject to little regulation and few controls, which in any event are frequently ignored by industry and commerce. The spread of the Karoo continues unabated and the critical situation of our topsoil continues to deteriorate. Furthermore there seems little likelihood of improvement under present socio-political circumstances. There is chronic overcrowding and consequent habitat destruction in the homelands, and gross abuse of the soil by a substantial but undetermined proportion of the country's 77 000 White farmers who control 71% of the nation's land. Add to this the burgeoning population which at current rates of increase will double within the next 30 years. In the case of the cities, there is evidence that levels of air pollution are generally static or decreasing (Kemeny, 1977). Nevertheless increasingly congested traffic continues to be subjected to short-term high-cost solutions, aggravated by uncontrolled if not deliberately fostered urban sprawl.

The situation is not surprising when one considers that responsibility for environmental conservation is spread over 14 government departments

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\* This includes all national parks, provincial, homeland and municipal game and nature reserves and areas under the control of the Department of Forestry.

(WLSSA, 1980a) and innumerable interdependent boards and councils. South Africa does not have a commitment to conservation in its constitution and only very recently (June 1980) has a government White Paper on 'a national policy regarding environmental conservation' been tabled. In principle this is a welcome move because in the past the central government has, by and large, shown little interest in the subject. In fact environmental conservation has provoked occasional antagonism where it has come into conflict with economic or political philosophy. Conservation is not a vote-catching cause in South Africa and one can count on one hand the number of politicians who can be regarded as environmentally aware\*. Some aspects of the White Paper have however generated a considerable degree of controversy among politicians and conservationists alike. In Natal in particular there is strong opposition to any proposals implying a shift of control and authority from provincial to central government level. At the time of writing (September 1981) no legislation emanating from the paper had been tabled.

Historically responsibility for promoting the general cause of conservation among the public has been shared by state bodies and private or voluntary organisations. There are now over 100 of the latter, some having been in existence since the last century. Many of these organisations are small and parochial but others such as The South African Nature Foundation (SANF), the local arm of the World Wildlife Fund, and the Wildlife Society of Southern Africa with over 20 000 members, are national organisations with international standing. The raison d'être of most private organisations have been either for the direct benefit of their members or to serve as pressure groups for the care of particular aspects of the environment such as soil or wildlife. Attempts to co-ordinate the very diverse views and activities of these organisations led, in 1973, to the formation of the Council for the Habitat upon which most of them are now represented. The reason for the creation of most of the statutory, provincial and municipal bodies concerned with conservation has nearly always been specific to a particular function (e.g. advising farmers on game stocking or trout

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\* As an example, during the 1977 general election, the writer approached 24 candidates of the three major White political parties in the Natal Midlands. Not one was prepared to state an unequivocal commitment to environmental conservation.

breeding) or a defined geographical area such as a park or reserve. Some, such as the Land Service Movement, have always had a broadly educational purpose.

A characteristic feature of the majority of conservation efforts and activities in the past (both government and voluntary) has been a myopic disregard of the 'non-White' majority of South Africans. Only in very recent times have Blacks, Coloureds and Indians begun to be catered for in terms of conservation amenities and facilities. On the other hand, although many of the organisations concerned with the environment and conservation in South Africa are non-racial they have drawn little support from outside the White community (Mdluli, 1977). Until very recently not a single one was Black, Coloured or Indian based.

The situation in Natal and KwaZulu is more acute than in the rest of the country (WLSSA, 1980b). Half of the Republic's annual topsoil loss is from the region (Hanks, 1976) and the population growth rate of KwaZulu is, at 3,2% p.a., among the highest in the world. If remaining unchecked it will reach some six million by 2000 A.D., and this in an area already severely degraded as a consequence of the over-population by people and domestic stock. Although the Natal Parks Board, the efforts of which the province is justifiably proud, and the Department of Forestry between them control only about 4% of the land area, these 'reserves' are rapidly becoming islands of envy surrounded by an ecological desert. Perhaps it is part of the reason why Natal and KwaZulu have spawned South Africa's most visible environmental education programmes.

In international reference South Africa does not compare well. Not only does it have a relatively low percentage of land set aside for conservation (WLSSA, 1980a), but there are several major international conservation conventions and treaties to which it is not a signatory (e.g. the World Heritage Convention). The South African record on issues such as whaling, ivory export and the spotted fur trade is a poor one\*. As in many other areas, we are, in conservation and environmental education, partially isolated from the mainstream of international thought and action.

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\* As recently as 21/7/1980, South Africa, at the International Whaling Convention meeting in London, cast a negative vote on a proposal for a ban on the hunting of endangered species.

Nor are we always represented at international gatherings. Concomitantly, from the writer's experience, little is known abroad of South Africa's conservation and environmental education efforts.

### 3.2 Environmental and conservation education\*

Environmental awareness and the related concepts of environmental education, conservation awareness and conservation education are relatively new in South Africa and were largely unknown 10 years ago. The interim period has however seen their rapid expansion both in practical application and in the public image. Much of this has been due to the efforts of a small number of dedicated individuals.

Education for soil conservation is the precursor of all other forms of environmental and conservation education in South Africa, efforts having been in progress for well over half a century (e.g. the Land Service Movement and the Veld Trust). Several other environmental and conservation organisations have for many years had an educational interest, albeit amorphous, but there appears to be no written trace of any evaluation of the educational work done or claimed to be done by any of them. It is of course difficult to say what the condition of our veld, soil and wildlife would have been like without their efforts, but overall their direct involvement in education appears until recently to have been minimal.

During the sixties, with the rapidly growing awareness of environmental and conservation issues and their relationship to education in Europe and North America, similar ideas began to filter through to South Africa. As early as 1967 SARCCUS (the Southern African Regional Commission for the Conservation and Utilisation of the Soil) held a symposium on 'Conservation and Education' which, although primarily concerned with soil conservation, also provided the first general overview of education for conservation in Southern Africa. Notwithstanding the lack of definition of terms, the fact that conservation and education were

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\* This section is based partly upon the document A Policy and Strategy for Environmental Conservation in South Africa (WLSSA, 1980a) to which the writer was a contributor.



recognised as related, was a milestone. Similarly, despite the general vagueness of ideas expressed on the topic, the symposium pre-empted many of the issues which were to become volatile in the seventies; questions such as ethics, where responsibilities lay and what priorities should be.

The 1970's, stimulated by activities abroad, have seen the rapid development of environmental education both conceptually and in terms of active participation by environmental organisations and individuals. Some modified their existing programmes while others set out to establish new ways and methods of achieving what they believed had come to be of high relevance to the future of mankind.

The Land Service Movement, the environmental arm of the Department of National Education, aims among other things at bringing school pupils into contact with nature. Although it appears that its emphasis in the past has tended to centre on arts and crafts, character development and socio-religious activities, there is currently a strong infusion of conservation education. Unfortunately, despite its national base, the movement has not found substantial support outside the White Afrikaans speaking community.

The other education departments in the country all to a greater or lesser degree involve themselves in activities broadly falling under the heading of environmental education. In Natal the Education Department has for many years operated regular camps such as the one at Cedara (where facilities are provided by the Department of National Education and the Cedara Agricultural College), and a major expansion of activity and suitable sites is currently being undertaken in co-operation with the Natal Parks Board, which five years ago also appointed its first education officer. The Natal Education Department has also given varying degrees of support to private organisations involved in environmental or conservation education. In the Transvaal the 'Veld School' system operated by the Education Department includes some conservation education among its courses, which however appear largely to be designed as an outdoor adjunct to the 'Youth Preparedness Programme'. The Orange Free State Education Department, in co-operation with the Nature Conservation Division of that province, operates both a

'Veld School' system and other conservation education courses. In the Cape the Department of Education actively supports the 'School in the Wilds', a field centre at Villiersdorp, where part of the course consists of conservation education, and runs a number of programmes of its own, some in co-operation with the Division of Nature Conservation.

The Department of Education and Training operates a well conceived system of environmental education called the 'Habitat Clubs'. As the name suggests it centres on club activities and has a very high conservation component (Kreuser, 1979). At the present time, although expansion is taking place, the numbers of pupils and teachers involved are still relatively small (J. Meyer, pers. comm.\*). Most of the governments of the homelands and national states have a commitment to youth organisations but with the broader educational problems with which they are confronted, environmental education at present often takes second place. A particularly promising situation exists in Bophuthatswana where one of the major uses envisaged for the new Pilanesberg National Park is declared to be educational (J.M. Ntsime, pers, comm.\*\*). A full time education officer has been appointed and the park is co-operating with the University of Bophuthatswana in setting up a comprehensive environmental education programme aimed primarily at teachers both in training and in practice. Among South Africa's Black leaders several are known to have strong personal commitments to environmental conservation.

The various parks and nature conservation divisions in South Africa have during the past four or five years become increasingly aware of the need for environmental and conservation education, and have involved themselves in co-operation with the education departments as well as in separate projects and programmes of their own. These range from the construction and provision of resource and visitor centres to the operating of quasi-educational trails and nature walks. Private touring and safari

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\* J. Meyer, Inspector of Agriculture, Department of Education and Training, Private Bag X212, Pretoria, 0001.

\*\* J.M. Ntsime, Secretary for Education, Bophuthatswana Government, Private Bag X2044, Mafikeng, Bophuthatswana.

companies have also realised the potential economic gain to be made by affixing the term 'educational' to their activities, and it is now commonplace to see every activity from a bus tour to a nature walk advertised as 'educational'. While there is unlimited merit in an educational approach to recreation, in the writer's experience very few touring-safari companies put this into practice in a meaningful way. With significant exceptions, tour operators and guides are fundamentally ignorant on matters of conservation education.

A major thrust into environmental education on a non-racial basis has been made by a number of private organisations. The efforts of the majority of these bodies currently appear to be concentrated in Natal. The Durban based South African Council for Conservation and Anti-Pollution (SACCAP), which in its eight year existence has been concerned mainly with physical pollution, has since 1979 begun to branch out into education and has extended its activities to the Transvaal. 'Keep South Africa Tidy' is a national organisation aimed at educating against littering, but its existence is seldom seen or heard of at school level. These two organisations have recently combined to give support to The National Environmental Awareness Council (NEAC), a community based movement for the general improvement of environmental quality in Soweto (Municipal Engineer, 1980).

'Veld and Vlei', the South African equivalent of the 'Outward Bound' courses found in other parts of the world, is essentially an outdoor adventure and character building programme whose courses have a built-in conservation awareness component. The experiences it offers are however only available to a relatively small number of children. The 'Wilderness Leadership School' founded in 1971 by far-sighted individuals such as conservationist Ian Player and educationist Don Richards, aimed to expose potential leaders and decision-makers, irrespective of creed or colour, to first hand educational experience in an unspoilt natural environment. The group aimed at, together with high course fees has resulted in the organisation becoming essentially elitist in nature.

Less elitist, at least in terms of Whites, is the substantial 'Conservation Awareness Programme' of the Wildlife Society of Southern Africa. Born of recalcitrant hunters in the late nineteenth century, the 'Wildlife

Society' traditionally drew its support from two unlikely sets of bed-fellows; scientists concerned with South Africa's rapidly depleting flora and fauna, and 'animal lovers', the vast majority of whose approach was sentimental and romantic rather than rational. The rapid growth of the Society during the seventies, coupled with its regular international contact, destroyed this cosy image and gave it a broad base of support which led directly to its educational involvement. This is now seen by the majority of its members and leaders as the most hopeful, if not the only road to environmental salvation. Unfortunately the Society, like so many other voluntary conservation organisations in the country, has failed to attract widespread support beyond English speaking Whites, although in recent years it has gained substantial credibility among Black leaders.

A major step in conservation education was taken in 1974 when, in a co-operative undertaking between the Wilderness Leadership School, the Natal Hunters Association and the 'Wildlife Society', the 'Joint Venture Programme', later to develop into the 'Umgeni Valley Project', was started on a game ranch near Howick. The area was later purchased by the 'Wildlife Society', which also took over the educational programme, to become South Africa's first nature reserve to be used and developed primarily for educational purposes. The aim was to provide an opportunity for school pupils and their teachers, irrespective of race, to experience nature and learn conservation principles at first hand, under the guidance of knowledgeable instructors and at a cost which most Whites and many Indian and Coloured parents could afford. While the original spirit has largely been retained, the project has developed to include one of South Africa's first 'field study centres' and, more importantly, has helped to pioneer the idea of all school subjects incorporating environmental values into their curricula. The potential long-term value of this approach is enormous. To date the programme has enjoyed substantial success which has however depended in large measure upon the co-operation and tacit support of various education departments, particularly the Natal Education Department, which have permitted the programme to be conducted on normal school days\*.

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\* Some 30 000 children of all races have spent about 90 000 child days in the reserve and over 2 500 teachers have been on the course. These figures and those relating to ACE are based on records of the Wildlife Society of Southern Africa.

Three other major environmental education programmes of the Wildlife Society of Southern Africa are 'Wildlife Clubs', the 'African Conservation Education' (ACE) programme and the 'Mhlalanyoni Project'. The national system of 'Wildlife Clubs' started in 1978 (and now partially supported by the South African Nature Foundation) is modelled on successful programmes in other countries such as Kenya, Zambia and the United Kingdom. It is only now becoming firmly established and thus little of direct relevance can be said at this stage. The ACE programme, started in 1975 (and now also supported by the South African Nature Foundation) functions in close co-operation with the KwaZulu government. It is aimed primarily at exposing practicing teachers to the full ambit of environmental problems, awareness and education. Courses last for four to five days and teachers are released from school to attend; to date some 750 teachers have been on course. Subsidiary aspects of the programme are environmental education extension work among farmers, students and the public. Under the leadership of Simeon Gcumisa the approach is interdisciplinary and the programme has broadened its activities to regular feature coverage in the press and peak-hour broadcasts on the Zulu service of the South African Broadcasting Corporation. Requests to set up similar types of courses have been made to the 'Wildlife Society' by the governments of several other homelands in South Africa and South West Africa/Namibia. The 'Mhlalanyoni Project', based in the Eastern Transvaal under Dr. Sue Hart, operates to provide audio-visual material on conservation topics, primarily for Black teachers, and to provide broadcast material on conservation for the Black services of Radio South Africa. Some of the material produced is now being used in neighbouring countries such as Malawi, Zimbabwe and Swaziland.

A point worth mentioning because of the cross-fertilization of ideas which has taken place, is the progress made in environmental education in some of our neighbouring states. Until partially interrupted by the civil war environmental education in Zimbabwe, then Rhodesia, was probably the most advanced in Africa. The formation in 1970 of The Rhodesian Education Courses for Conservation of the Environment (RECCE) led to the establishment in 1972 of the well known 'School in the Bush' at Mushandike, the direct involvement of the National Parks Service in education and the then University of Rhodesia's involvement in conservation education at the teacher training level — a lesson yet to be learnt in South Africa

(Bezuidenhout, 1976; Parker, 1976; Rushworth, 1976). There are signs that these programmes are now recovering (S.F. Parker, pers. comm\*). In Swaziland the Mlilwane Reserve and the Swazi National Trust are directing the bulk of their efforts towards environmental education, while in South West Africa/Nambia the 'Otjampaue Project' near Windhoek was set up in 1979, being modelled on the Umgeni Valley Project (H. zur Strassen, pers comm.\*\*).

In 1976 the first Conservation Education Symposium dealing with the subject in a broad and interdisciplinary sense was held at Skukuza, in the Kruger National Park. Its major value was that for the first time it brought together most of the individuals involved in environmental education and conservation education programmes and projects in Southern Africa. Regrettably however, not a single practicing school-teacher was present and presumably it had not occurred to the organisers that they might have a role to play. The highlighting of this aspect has, in Natal at least, had the effect of causing the small but growing numbers of teachers concerned with environmental education to become increasingly vocal. Although this has involved mainly biology and geography teachers there are welcome signs of participation by other disciplines such as history and languages. The other major functions of this nature to have thus far taken place in South Africa were the 1980 UNISA Workshop on Outdoor Education referred to in Chapter 2 and the 1981 Environmental Education Symposium held at Pietermaritzburg under the joint auspices of UNISA and the Natal Parks Board. Regrettably both were held at a time when very few practicing teachers could attend.

The question of school-teachers and environmental education is an interesting one to which we will refer in more detail in later chapters. Suffice it to say at this stage that teachers are as often as not uninterested or uninformed. This is in very large measure due to their being untrained in environmental matters and thus unfamiliar with the issues involved, be

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\* S.F. Parker, Science Education Centre, Box MP 167, Mount Pleasant, Salisbury, Zimbabwe.

\*\* H. zur Strassen, Wildlife Society of South West Africa, Box 2058, Windhoek, 9100. The project was visited and assisted by the writer in October 1979.

it ethics or pollution problems. They are furthermore often hampered by the inflexibility of the systems within which they work. Where individual teachers are interested in environmental education or conservation, they frequently come up against the indifference or occasional antagonism of their principals, many of whom are sport-orientated to the exclusion of most other activities.

To summarise, both state and private organisations have begun in recent years to move falteringly towards the creation of a higher level of environmental awareness. This progress has been constrained by a lack of definition and conceptual clarity which has resulted in few clear policy aims and a general lack of direction. Attempts made thus far have generally been piecemeal and sporadic with a minimum of effort directed towards the lower socio-economic majority of all races and cultural groups, so that conservation remains an essentially elitist concern. There is also a lack of both expertise and finance to investigate and carry out the task, and insufficient co-ordination and communication among interested bodies. All too often projects and attempts to generate environmental awareness have been regionally isolated and parochially guarded. The existing programmes furthermore represent only segments of a continuum and have by and large stemmed from an individual's or group's desire to promote what they believe to be right. To borrow a quotation from Aldrich and Blackburn (1975, p.173):

"... these special interest focuses, however well-intended, are in essence public relations materials, not the open-ended total-systems approach needed to educate the public about their environment and its interacting and inter-related problems."

### 3.2.1 The Hurry Report

A major step in the clarification of perspectives was taken in 1978 with the publication of the Report on Conservation Awareness and Formal Education (Hurry, 1978) referred to earlier. The report was a preliminary assessment of the extent to which conservation awareness, as delineated by Hurry (refer Chapter 2), is generated by formal education in South Africa, particularly through the subjects of biology and geography. It is the only study of this type thus far to have been

published and as its findings have a direct relevance to the present research it is worth summarising in some detail.

The salient points made by Hurry were;

- a. That in terms of school syllabus and conservation awareness:
  - i. All school syllabuses contain reference to environmental awareness but to what extent this equals conservation awareness is an open question;
  - ii. While awareness, reason and observation are dealt with there is little in the way of positive action in connection with the pupils' daily life. It was suggested, among other things, that educational objectives for the pupils be reviewed so as to include awareness of the principles of conservation and their translation into action, to lead to positive changes in behaviour patterns (i.e. the development of a conservation consciousness). This would necessitate a review of aims, contents and length of syllabi.
- b. That in terms of the practice of teaching:
  - i. Subject committees exist which do have regard to conservation awareness but that there is insufficient communication between people and committees with similar interests. He foresaw the need for expanded contact and a common strategy.
  - ii. There exists a general shortage of suitable resource materials including audio visual aids. He made various suggestions for improving the situation including the role which non-government bodies could play in co-operating with State Departments.
  - iii. That the emphasis upon the practice of 'fieldwork' and 'field studies' varies widely both in concept and execution as well as due to teachers' abilities and interests. Here too the need for wider co-operation was emphasised.
- c. That in terms of Teacher Training Colleges there was little evidence of a policy or effort to develop a holistic 'overview' of the environment by different subjects, even those as closely allied as geography and biology.

Hurry recommended that in and among Colleges of Education there should inter alia be:



- i. Greater cross-discussion among different subjects.
  - ii. A meeting of all College lecturers of biology and geography, from all education departments, to discuss what is being done for conservation awareness in teacher training programmes, and what might be done to improve the ability of teachers of all subjects to put the message of conservation across. This presupposes a commitment to this aim.
- d. That a national effort is needed. The urgent need to co-ordinate all efforts (government and non-government) related to conservation awareness was stressed and it was recommended that a National Conservation Awareness Committee be established.

In conclusion Hurry pointed out that in conducting his survey he had received positive impressions as well as negative ones and that there was a great deal of diversity both in the conceptualisation and implementation of conservation awareness in South Africa. He felt that conservation awareness or environmental awareness must not be seen as an 'extra' subject to be taught in the schools but rather as part of the general fabric of education. To develop a conservation ethic in a child was to educate him to his proper position in his life system. Perhaps the most startling point of all to come out of the survey is that at the time of the report not a single teacher training establishment in the country offered a course in environmental education, despite suggestions to the contrary by Jooste (1967). Subsequent to this report an environmental awareness component has been built into all courses at the University of Bophuthatswana, not only into those concerned with the training of teachers. Several other teacher training institutions in South Africa are also known to be considering the matter.

Hurry's views are in sharp contrast to the rather more complacent picture painted of Conservation Education for Schoolchildren in South Africa by Engelbrecht (1976, p.124). After describing some of the conservation activities in which the various education departments were involved, he was content to conclude that "Throughout the Republic much good work is being done in this field". Even allowing for the fairly substantial advances made since 1976, it is difficult to accept that this conclusion was based on either an adequate knowledge of the situation or a clear impression of what conservation awareness and even education are all about.

### 3.3 Environmental and conservation awareness

The state of environmental awareness of the South African population has not been determined, the only likelihood of any certainty being that it varies across the spectrum of culture, race and socio-economic circumstances; differences which are fairly obvious to the careful observer. There is also no evidence to suggest that the level of awareness of professional groups involved with the transmission of environmental values, such as town-planners, engineers and teachers, is any higher than that of the public in general, despite the obvious desirability of this being so (WLSSA, 1980a). The environmental standard of public works to be seen in many of our cities and in the countryside may indeed provide the basis of a case to suggest that the environmental awareness of planners and engineers is below the hypothetical average for the public, while evidence led in a later chapter suggests that teachers may be less aware than their pupils. Reference has already been made to politicians.

Despite the lack of concrete knowledge in this respect a skeletal picture may be built up by looking at current trends and using what generalised information is available. In the case of Whites, who are effectively the majority of the higher income group, there are a number of useful pointers such as:

- a. The number and circulation figures of environmental and conservation publications.
- b. The rapidly increasing demand for wilderness trails, the use of the National Hiking Way and even urban trails.
- c. Membership of environmental and conservation orientated organisations.
- d. The growth of the recycling industry, particularly in the large cities where it is economically more viable due to economies of scale.
- e. The number of visitors to national parks, game and nature reserves.

Figures available\* for all these facets suggest a sharp upward trend over the past five years and it is arguable that this at least represents some increase in awareness. One must not be misled however as the proportion

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\* Obtainable from the following sources: National Hiking Way Board, Keep South Africa Tidy, Department of Forestry, National Parks Board, Natal Parks Board, Wildlife Society of Southern Africa.

of the population supporting environmental movements or participating in conservation activities is still minute and it is probably true to say that the vast majority of Whites have never set foot in a game or nature reserve or even in a botanical garden. Nor are South Africans great walkers. In an informal survey in the Drakensberg — prime walking country — the writer found that approximately 80% of hotel visitors never walk further than 1km from the hotel in which they are staying.

It is less easy to determine the situation among other race and cultural groups in South Africa. In the case of Indian and Coloured people, other than occasional reports of environmental symposia at schools, apparently rare visits to game and nature reserves (for which figures could not be obtained) and their participation on courses such as those at Umgeni Valley, very little is known. In the researcher's limited experience with Indian people, the general impression gained is that they have little interest in the natural environment. This is perhaps partly explained by their high level of urbanisation and very gregarious cultures. What is apparent however, particularly among Hindu people, is a sense of respect for all forms of life which other cultures might well emulate.

Mdluli (1977) has drawn attention to a number of factors affecting environmental awareness among Black people. Among these are the interplay between traditional and western values, access to education and the population explosion. Existing levels of environmental awareness are however more difficult to determine. As Black people generally fall into the lower income brackets, criteria used in assessing Whites are inapplicable. A number of other factors are however relevant;

- a. Figures available indicate that given the facilities there is widespread use of them; witness Manyaleti Reserve which over 15 000 children alone visit each year.
- b. Linguistically the Bantu languages are 'closer to nature'. Many words and phrases in common use relate to the natural environment and natural objects in context, an unusual feature in modern Indo-European languages.
- c. Culturally and traditionally, Black people of Southern Africa have lived in harmony with nature rather than opposed to it. Their record of 'wise use' even in historic times is in sharp contrast

to the widely practiced Western philosophy of 'taming the wilderness' (Merton, 1968).

By way of illustration it is argued very strongly from experience that an average group of Black teachers has a higher overall level of environmental awareness than an average group of White teachers, despite the latter group's generally higher level of formal education. This may come as a surprise to people conditioned to viewing the rural Black person as highly destructive of his environment. The fact that this is frequently the case is not denied, but it is in good measure a result of economic and population pressures as well as the fatalism which has, for reasons beyond present discussion, all too often become the hallmark of his existence. He is not innately destructive and need not continue to behave so in more advantageous circumstances. Environmental degradation for survival, no matter how ethically wrong or environmentally harmful, is very different from environmental degradation for greed and luxury.

How then, it may be asked in the light of what has been said, do people become environmentally aware? The answer is undoubtedly complex and we do not yet even know what questions to ask. Quite clearly both formal and informal education must play a role, whatever their respective shortcomings. Personal background and experience must likewise be major factors but in what way we do not know. For the general public the mass-media are probably the most important source of environmental education, but no analysis of this has as yet been carried out. The media are moreover frequently inaccurate and sensational, often only highlighting the unusual and exotic rather than exploring what is commonplace or relevant. That the potential exists, particularly in terms of South Africa's natural endowments, to structure and implement some of the most comprehensive environmental and conservation education programmes in the world is beyond doubt, but we must guard against over-optimism about their effect or results, the history of soil conservation being a case in point\*. What is needed is not only recognition of the need

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\* For many years responsible and far-sighted individuals such as General J.C. Smuts and T.C. Robertson drew attention to the impending crisis but all the available evidence suggests that the message was largely lost on those for whom it was intended. The fact that in 1971, Dr. S.J. du Plessis, an advisor to the Minister of Agriculture, in reviewing

for conservation as a way of life, but a new approach to achieve this. The 'tried and trusted' ways appear in many instances to have failed and new ways and methods must be sought.

With such dark gods in mind we now turn to an examination of the actual situation among a sample group of South African adolescents.

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the first 25 years of the Soil Conservation Act of 1946 could state that neither it nor any of its related educational programmes and incentives had had any apparent influence or effect on the rate of soil erosion (Clarke, 1974), is a damning indictment of the gap between our aims and achievements.

#### CHAPTER 4 METHODS OF RESEARCH

The research was conducted in line with the motives expressed in Chapter 1 and against the definitive, historical and educational background outlined in Chapters 2 and 3. The target group upon which the research was conducted is described in Chapter 1 and, as stated there, the method decided upon was to undertake a sample survey using a statistically scored questionnaire which would be given to each member of the sample group. Following Roscoe (1975, p.135) "the practice of sampling is permitted for the conducting of an otherwise impractical piece of research" i.e. measuring the whole population of the target group. It is recognised that using techniques of statistical inference entails the risk of not necessarily giving a true reflection of the population, but within these limitations one can draw conclusions not otherwise possible. The research programme took place in four stages: preliminary preparation, the administration of the questionnaire, analysis of results and presentation of results.

##### 4.1 Preliminary preparation

In order to conduct the sample survey in a meaningful way, a substantial amount of preliminary investigation was required as no previous work of this nature could be traced in Southern Africa and very little material on environmental or conservation education is generally available in South Africa\*. Also, as the survey had necessarily to be undertaken at schools during normal class time the co-operation of the Natal Education Department and several private schools was sought and obtained at an early stage.

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\* The writer and three other workers in the field, Mr C. Nightingale of Pinetown, Mr L. Hurry of Pretoria and Ms S. Bayne of Johannesburg, probably possess between them the greater proportion of all information and material available in the country. This assertion is based upon the writer's contact with these and other individuals in the field as well as information requested from overseas organisations on their Southern African contacts.

The preliminary stage had three major components which operated partially concurrently.

- a. The development of international contact through correspondence. Starting on a small scale this had a mushroom effect which enabled and justified the undertaking of a study tour in Europe.
- b. A three month study period in Europe visiting relevant people and places. Countries visited were the United Kingdom, Netherlands, France and Switzerland. The world headquarters of the three major international organisations concerned with environmental education were visited i.e. the IUCN, WWF and UNESCO/UNEP as were those of two European regional organisations, the Council of Europe and the North West Europe Regional Council of the IUCN. Four small international meetings and seminars which took place during this period were attended, enabling the writer to meet American, East European and Third World conservationists and environmental educationists. Numerous national and local organisations concerned with environmental education were visited, particularly in the United Kingdom. As a result of the study tour a substantial amount of material and literature was collected which provided a broad base of background information. Appendix A contains a list of correspondents, individuals consulted and places visited.
- c. The design and development of a questionnaire.

#### 4.2 The questionnaire

Three questions are posed in the construction of any research questionnaire: What questions should be asked to best fulfil its aim?, How should it be structured in terms of question order, juxtapositioning and sub-sectioning?, How should it be administered? To provide answers, a number of general principles were set out, questions designed within that framework and then tested in a number of pilot surveys. The pilot surveys were used to iron out ambiguities and inconsistencies in expression, and to make certain the administration of the questionnaire would run smoothly, particularly as there was a time constraint. Throughout the construction period, the researcher was fortunate in having access to members of the target group for pre-tests of this nature. None of these individuals

were however included in the final sample group. The final questionnaire as administered, together with all instructions, is included as Appendix B.

#### 4.2.1 General principles of construction

##### 4.2.1.1 Relating to content

After background study and consultation the following criteria were decided upon:

- a. That what was to be tested was a general level of conservation awareness set in a wider framework of environmental awareness. It was accepted that awareness is a compound of factual and conceptual knowledge as well as attitudes based upon these, but it was decided that no attempt would be made at this stage to unravel or delineate these three elements. The approach was rather to be a comparison of the general level of conservation awareness with background experiences in environmental conservation terms.
- b. That in concurrence with the study's aims and objectives there were to be questions or groups of questions designed to elicit:
  - i. Relevant aspects of each pupil's background in terms of experiences relating to nature conservation.
  - ii. Pupils' knowledge of some universal ecological and conservation principles and concepts. (Wherever possible, expression of these questions were to be in familiar terms i.e. African and terrestrial).
  - iii. An indication of the levels of optimism or pessimism about the future in environmental terms.
  - iv. Pupils' views of themselves in relation to environmental and conservation issues.
  - v. Pupils' views on certain environmental and conservation issues external to themselves i.e. on issues over which they perceivably had no immediate control.
  - vi. Contradictory values on environmental matters held by individuals i.e. 'what I know to be right and what I in fact do or might do'.



#### 4.2.1.2 Relating to structure

After consideration of the issues involved it was concluded that the questionnaire should be structured in such a way as to:

- a. Incorporate statistically scorable sections on;
  - i. Pupil's conservation background (as per 4.2.1.1 b. i. above).
  - ii. Awareness of ecological and conservation principles (as per 4.2.1.1 b. ii.).
- b. Provide a means of eliciting personal views and opinions on a number of environmental topics (as per 4.2.1.1 b. iv. to vi).
- c. Include a method for eliciting contradictory values (as per 4.2.1.1 b. vi.) either without the pupils realising it or being unlikely to prevent it if they did. The basic method decided upon was to set two or more questions in which similar or identical principles appeared in different circumstances, and then see to what extent reactions were based upon the underlying principle or on a particular situation, which often had a built-in component of self-interest. The actual techniques employed to achieve this are covered in section 4.2.1.3 below.
- d. Allow verbal as well as printed administration of questions. Verbal questions were seen primarily as a method of minimising the alterations of earlier responses when a conflict situation arose. The terms 'verbal' and 'printed/non-verbal' are used throughout the study to describe the method in which individual questions were administered. In the case of verbal administration pupils had only answer sheets and questions were read out, while in the case of printed administration pupils were presented with printed questions and answer sheets.
- e. Allow the results of any question to be compared with any other question.
- f. Allow easy and simple administration.
- g. Allow easy and efficient collating of data resulting from the questionnaire.

Apropos both content and structure as well as in terms of time constraints the inevitable problem of depth versus breadth in questioning arose. It was decided, because of the experimental nature of the study, to place the emphasis upon breadth of coverage.

#### 4.2.1.3 Relating to administration

It was decided that the following principles should operate:

- a. That the administration be carried out by the researcher in person in order to obviate inconsistencies, deviations and delays.
- b. Each individual in the sample group was to be asked to complete an anonymous questionnaire on an entirely voluntary basis. They were to be told that they could leave out any section or individual question which they did not wish to answer, as it was considered unsuitable to attempt to force an answer which might then not be a true reflection of the respondent's view. Pupils were to have the nature and purpose of the questionnaire explained to them before starting, and after completion could ask any questions they wished.
- c. Pupils were not to be left to complete the questionnaire on their own but for two reasons would be guided carefully through it. These were, firstly, to ensure some degree of control over the time spent on each question, so that all questions had a fair chance of being answered; and secondly, to optimise the utilisation of techniques designed to elicit contradictory values held by pupils. The techniques employed were to be an integral part of both design structure and administration, the underlying principle being that it should be extremely difficult to alter a previous response when the answer to a later question appeared to contradict it. This was to be achieved by a combination of:
  - i. The use of verbal questions which could not easily be checked back in relation to the answer sheet.
  - ii. The scrambling of questions i.e. mixing them up so that they would not necessarily be presented in a logical order and would be interspersed by questions on different topics. The assumption here was that pupils would lose track of exactly what they had said in response to which questions.
  - iii. Time restrictions on individual questions. Not only were pupils to be given a limited amount of time in which to respond to individual questions but if they kept pace, they would not have time to go back and alter responses. No time would be given at the end for looking over the

questionnaire or for making amendments to responses. This technique was based upon the assumption that spontaneous responses were likely to be a truer reflection of actual values held than considered responses would be (Maldague, 1976).

The success of these techniques is evaluated in Chapters 5,8 and 9.

#### 4.2.2 General constraints operating in construction and administration

A number of constraints operated in applying these principles:

- a. The time which schools would allow for the administration of the questionnaire would be limited and as final entry was subject to the approval of the headmasters and headmistresses concerned, it was considered prudent that the questionnaire should fit into one 35 minute period, which was the minimum likely to be encountered. Every question thus had to be carefully examined in terms of the value of the results which it would be likely to render. It also meant that not all conservation issues, ecological principles or pollution hazards could be covered.
- b. In the selection and framing of questions it had constantly to be borne in mind that one was aiming at standard nine pupils of mixed-ability, not university students and not A classes, if the sample was to bear a meaningful resemblance to the target group. It was necessary to keep the questions relatively simple in expression while nevertheless phrasing them in such a way that the required information was obtained. Closely connected to this was the problem of how direct, inferential or loaded each question should be, while nevertheless appearing clear and unambiguous to the pupil.
- c. The type of political, social and religious question which could reasonably be asked of a standard nine pupil was limited. As conservation is in part related to all three of these matters, there is in a sense a significant gap in this regard.
- d. As the sample group was composed of two cultural groups (Afrikaans and English) and four sub-cultures of these groups

- (urban, rural, male and female) the issue of cultural bias arose. While every effort was made to avoid blatant cultural bias, as the questionnaire was not standardised on large numbers before administration, the existence of subtle biases is inevitable. Where this is felt to have occurred the matter is dealt with in the text under the question concerned.
- e. In terms of objective scoring, the relative merits of controlled (i.e. where 'Yes/No/Not Sure' options are the only alternatives offered) versus open-ended responses and questions had to be considered. In the event both types were included, with clearly delineated but not rigid criteria of acceptability for open-ended responses.
  - f. A restriction was placed by the Natal Education Department in terms of information which could identify schools or pupils. With this the writer fully concurred.

It will be apparent from what has been stated in earlier chapters, that many aspects relating to the construction of the questionnaire had no empirical precedent or historical base upon which to draw. In such cases the ultimate recourse was simply to ask whether what was being stated or asked was, in the circumstances, reasonable or not. The fact that the concept of reasonableness is an accepted and regularly expressed part of our legal system was considered sufficient justification for its application to this study.

#### 4.2.3 Final form

The final form of the questionnaire (Appendix B) as administered to the sample group consisted of four sections in which all the principles outlined in 4.2.1 above were incorporated:

SECTION A (examined in detail in Chapter 6) was composed of questions about the pupils' background and experiences which might be relevant to, or have an influence upon his/her level of 'conservation awareness'. There were 15 questions of which all but three were to be scored and totalled to give an Index of Background Experience (IBE). All questions were in printed

form, some responses being controlled and others open-ended.

SECTION B (analysed in Chapter 5) was composed of 12 questions consisting of 24 constituent parts and based on some universal ecological and conservation concepts. All questions were to be scored and totalled so that in effect this section was a Conservation Awareness Test (CAWT\*). This section was entirely verbally administered so that it was possible to design questions seeking not only conservationally sound answers but the contradictory values outlined in the principles of construction. Ten of the questions were composed of both controlled and open-ended responses and two were open-ended only.

SECTION C contained 23 questions pertaining to the pupils' views of themselves in relation to nature conservation as well as on nature conservation in the wider context of the environment and society.

SECTION D consisted of six questions aimed at assessing pupils' views of some environmental problems, and a measure of their optimism or pessimism in relation to these problems.

Sections C and D of the questionnaire (dealt with in Chapter 8) were not designed to be scored as most of the responses sought were matters of opinion rather than clear-cut answers. Like Section B, Section C was designed to elicit certain contradictory values. The first part of Section C (C1 - C16) was verbally administered and consisted entirely of controlled responses. The second part of Section C (C17 - C23) and all of Section D were administered in printed form with a mixture of controlled and open-ended responses. Some questions in Sections C and D were deliberately scrambled. When results were analysed questions were re-grouped for comparison e.g C3, C19 and C23. The scores of Sections A and B were intended for direct comparison and correlation, while relevant individual questions in Sections C and D could be compared with either individual questions in Section A or Section B, the IBE or the CAWT. Details concerning the application of the principles referred to and of

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\* The abbreviation CAWT was decided upon in preference to the more obvious CAT, as the latter is the standard abbreviation for the well known Children's Apperception Test.

scoring procedures are dealt with in the relevant parts of ensuing chapters.

#### 4.2.4 Administration

Permission to involve 11 selected provincial schools and three private schools in the research programme having been obtained, appointments were made to see the heads of the schools concerned. (The basis of selection is covered in 4.3 below). The situation was explained and requests made to conduct the research. There were no refusals and, with one exception, principals and teachers went out of their way to be helpful and co-operative.

The questionnaire itself was personally administered by the researcher, strictly following the principles outlined above. Pupils were led through the questionnaire on a pre-determined time schedule based on the pilot surveys. (Refer to Appendix B for individual question time allocation). The total time required for completion, determined by trial runs, was 33 minutes, which in all but one case sufficed. Notes were also made on the pupils' attitudes to the test before, during and after its application. With the exception of one school, pupils were co-operative throughout. In the case of this exception pupils were initially hostile and loutish but settled into a sullen routine once the test had begun. The school concerned produced the second lowest overall scores for Sections A and B. More happily, on all but two occasions (once due to the end of the period) pupils availed themselves of the opportunity to discuss the questionnaire after completion. The post-test attitude of several groups was genuinely enthusiastic and most pupils would probably have talked happily into the next three periods!

Three minor problems arose during the administration phase:

- a. Although, because of 'subject-setting', most standard nine classes in Natal are mixed-ability groups, it was only with some difficulty that the heads of some schools were persuaded to allow access to them as opposed to bright classes which they felt would show the school up in a better light — despite the assurance that schools and pupils would remain

anonymous.

- b. At two schools the researcher was taken to the class about 10 minutes after the allocated period had commenced, thus leaving insufficient time for completion of the questionnaire. In one case it was possible to overlap into the next period but in the other, Section D remained unanswered.
- c. The third problem had potentially wider implications in that the size of classes was generally smaller than had been expected. Despite initial concern, in the end the result was not materially affected as several principals assisted by allowing access to their largest mixed-ability classes, one even permitting disruption of the time-table.

No pupils refused to answer the questionnaire as a whole, although some questions were consistently less frequently answered and others consistently poorly answered. Possible reasons for these occurrences are discussed in later chapters under the headings of the questions concerned.

#### 4.3 The sample group

The target group, i.e. White standard nine pupils in Natal in 1978, consisted of 7 762 individuals\*. Following Moroney (1968), Mann (1971) and Roscoe (1975) a sample size of approximately 4% i.e. 310 pupils, was sought. With an average standard nine class size of 22 pupils, suggested as a working figure by a number of principals consulted, it was thus necessary for 14 classes to be surveyed. As one school allowed two classes to be included the total rose to 15 classes in 14 schools spread over Pietermaritzburg, Durban and the Natal Midlands. The final number of pupils involved was 306 or 3,94% of the target group. Table 4.1 gives a description of the schools, and the language group, sex and numbers of pupils involved in the study.

Roscoe (1975) points out that a sample is only random if chosen in such a way that all sub-groups have an equal chance of representation, but this was not entirely the case in this study. In conformity with stated

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\* Figure provided by Natal Education Department to include private schools.

**TABLE 4.1** SCHOOLS AND PUPILS INVOLVED IN THE STUDY BY LOCATION, LANGUAGE AND SEX

No.	DESCRIPTION*	LOCATION	PUPILS			
			Language Medium	Sex Ratio $\frac{\text{♂}}{\text{♀}}$	n	Questionnaire Numbers
1	Provincial co-educational Afrikaans medium	U	A	14/15	29	1 - 29
2	as above	U	A	7/17	24	30 - 53
3	as above	U	A	14/10	24	54 - 77
4	Provincial co-educational parallel medium	R	A E	8/10 12/8	18 20	78 - 95 96 - 115
5	as above	R	A	10/17	27	116 - 142
6	Provincial co-educational English medium	R	E	11/10	21	143 - 163
7	Provincial boys, English medium	R	E	14/0	14	164 - 177
8	as above	U	E	18/0	18	178 - 195
9	as above	U	E	20/0	20	196 - 215
10	Provincial girls, English medium	U	E	0/23	23	216 - 238
11	as above	U	E	0/17	17	239 - 255
12	Private boys, English medium	R	E	9/0	9	256 - 264
13	Private girls, English medium	U	E	0/20	20	265 - 284
14	Private boys, English medium	U	E	22/0	22	285 - 306

N = 306

\* As at September 1978. Some changes have since occurred.



aims and objectives, schools were selected specifically to include representatives of the following six sub-cultural groups, hereafter referred to as 'sub-groups'; 'urban' and 'rural' pupils, male and female pupils, Afrikaans and English speaking pupils. In addition pupils from private schools, a technical school and an agricultural school were included in the sample.

Two further factors are pertinent in terms of the composition of the sample. The first is that even within the confines of Natal, the survey was spatially localised upon the two major cities and the Midlands (refer to Figure 4.1). Although the area contains approximately 84% of the target group, it does not include any schools in Northern Natal or Zululand. While in most questions this may not materially affect the results, where it might well do so is in questions A7 and A8, which have an intrinsic locational component. The second factor is that small minority groups with discrete cultural identities, such as the Jewish or German speaking communities, were not specifically included in the sample or identified within it. Not only would there have been objections or difficulties in obtaining information of this nature, but detailed cultural analysis of this type did not fall within the purview of the study.

Once having decided upon the schools, the researcher had in a sense, to take what came in terms of sub-group numbers. The alternative would have been to calculate a representative sample of the target group for each sub-group and then either survey only that number of individuals or else extract the number required, on a random basis, from the actual samples taken. These methods were not followed as in the first case it would have been difficult, in practical terms, to survey only a portion of classes. There would also have been the difficulty of subdividing them according to proportionate requirements. In the second case the method could have been followed, by taking a larger sample to cater for the male/female and Afrikaans/English requirements, but for the urban/rural breakdown, figures relating to the target group were not available. To obtain them would have been a major undertaking. The researcher moreover felt sufficiently strongly, from personal experience, about the need to test (and thus prove or disprove the second major hypothesis of this study) the potential differences in response patterns between pupils of urban and rural schools. It was decided to include this category of breakdown at the risk of probable,

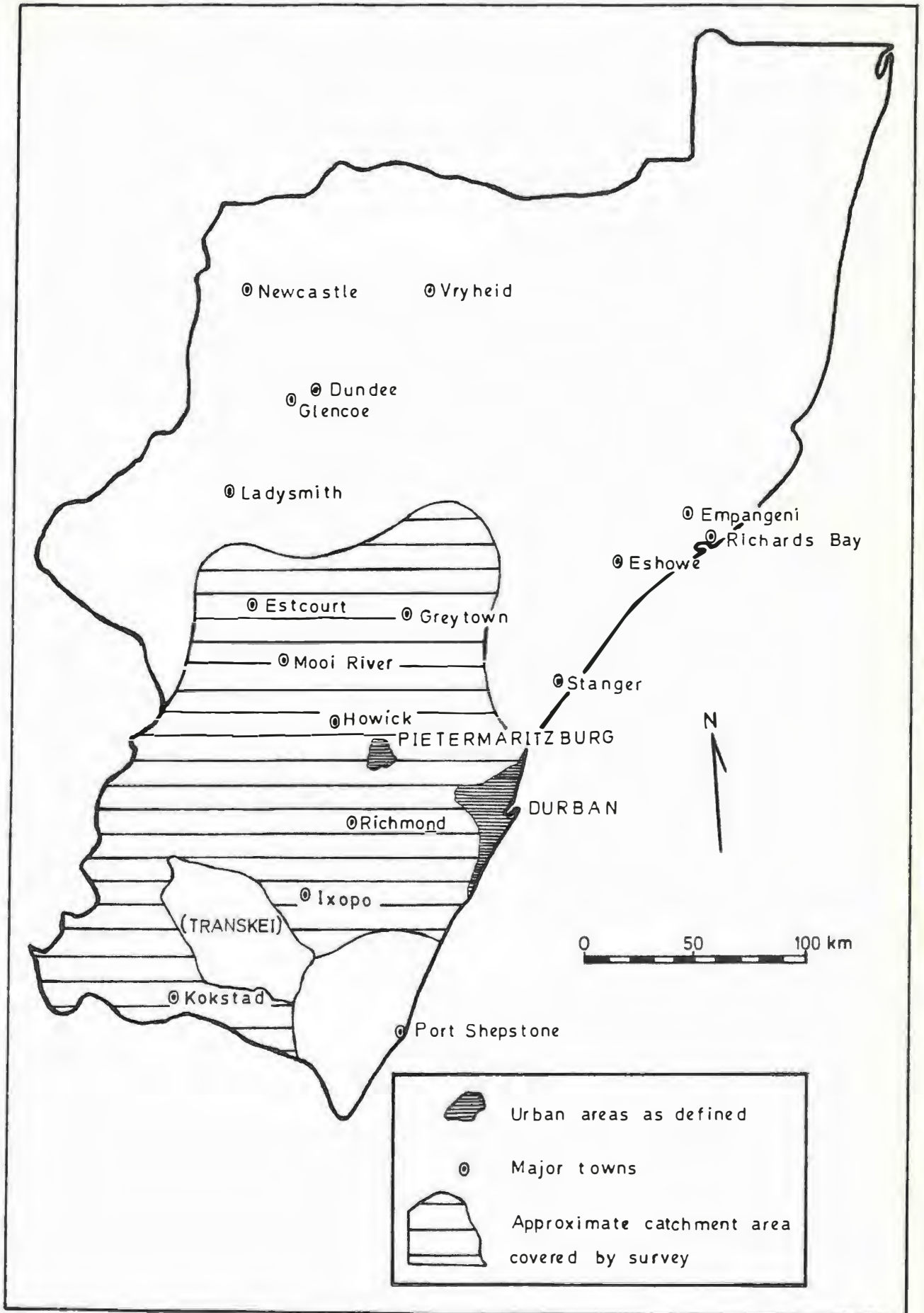


FIGURE 4.1 MAP OF NATAL INDICATING AREA COVERED BY SURVEY

but relatively minor, statistical inaccuracy.

In delineating the sub-groups, the division of males and females was simple enough, the required information being available from the questionnaire. Afrikaans and English subdivisions were based upon the language medium in which the pupil was taught and in which the questionnaire had been administered and completed. Urban schools were defined as those in the cities of Pietermaritzburg and Durban, while the term rural was applied to all the other schools in the survey i.e. those in or near country towns such as Mooi River. This method of categorisation had a built-in complication in that there are 'city-children' in rural schools and vice versa. Analysis of questions A4 and A5 in relation to the school concerned showed numbers to be small but not insignificant; 26 out of 197 'urban' pupils (13,20%) had declared their homes to be in rural areas, while 19 out of 109 'rural' pupils (17,43%) declared their homes to be in urban areas. In the case of these pupils it is difficult to say whether the home or school is the greater influence, but as the majority of the pupils' time was spent in the environment of the school, this was assumed to be the overriding factor. The connotations given to the terms 'urban' and 'rural' remain constant throughout the study.

The sub-groups can be regrouped into 20 further combinations for analytical purposes, as shown in Table 4.2. The table also shows the numbers of pupils involved, symbols used to represent each sub-group and combinations in the text and in tables, and the designation given to various 'groupings' of sub-groups and combinations as used in the tables. In addition to these, three other sub-cultural groups were delineated for comparison with their peers on certain questions where it was felt that their opinions might differ substantially — a decision vindicated by evidence led in later chapters. These were farmer's children (defined as having at least one parent as a full-time farmer) of whom there were 49; pupils who had lived part of their lives abroad (defined as outside of Greater South Africa or South West Africa/Namibia) of whom there were 29; and 51 pupils in private schools.

#### 4.4 Data analysis and presentation

Completed questionnaires were numbered from 1 to 306 in the order in which

**TABLE 4.2** SUB-GROUPS AND COMBINATIONS SHOWING NUMBERS OF PUPILS INVOLVED, ABBREVIATIONS USED AND DESIGNATION OF COMBINATION GROUPINGS

ABBREVIATION	DESCRIPTION	n	N	GROUPING DESIGNATION FOR USE IN TABLES
U	Urban pupils	197	} 306	These sub-groups presented together for comparative purposes are termed the STANDARD GROUPINGS.
R	Rural pupils	109		
A	Afrikaans speaking pupils	122		
E	English speaking pupils	184		
♂	Male pupils	157		
♀	Female pupils	149		
m	Afrikaans speaking males	51	} 306	These combinations, used to highlight certain results and trends are termed SELECTIVE GROUPINGS.
f	Afrikaans speaking females	71		
M	English speaking males	106		
F	English speaking females	78		
UA	Urban Afrikaans speaking pupils	77		
RA	Rural Afrikaans speaking pupils	45		
UE	Urban English speaking pupils	120	} 306	
RE	Rural English speaking pupils	64		
U♂	Urban males	91		
U♀	Urban females	106		
R♂	Rural males	66		
R♀	Rural females	43		
Suffix F	Farmer's children	49		
Suffix A	Pupils who have lived abroad	29		
	Pupils of private schools	51		
Um	Urban Afrikaans speaking males	31	} 306	These combinations, used for the grouping of raw data, constitute the first steps in analysis. They are used to build up the other combinations and sub-groups and are termed BASIC GROUPINGS.
Uf	Urban Afrikaans speaking females	46		
Rm	Rural Afrikaans speaking males	20		
Rf	Rural Afrikaans speaking females	25		
UM	Urban English speaking males	60		
UF	Urban English speaking females	60		
RM	Rural English speaking males	46		
RF	Rural English speaking females	18		

they were received at the schools, a method chosen to facilitate later reliability tests using the 'split-half' coefficient based on odd and even numbers. Each questionnaire was given a four letter code (based on the symbols given in Table 4.2) prefixed to its number and made up as follows: the first letter indicated the language group and sex of the pupil i.e. m,f,M or F, the second letter whether the pupil's school was classified as urban or rural i.e. U or R, the third letter whether the pupil's home town as stated in question A4 was urban or rural, while the fourth letter indicated whether the pupil's background over the previous 10 years, as given in question A5, was predominantly urban or rural in orientation. While there was a definite intention to analyse data on the basis of the first two code letters, this was not the case with the last two. They were incorporated simply in case they might be required for further analysis at a later stage. In the event they were not used other than to deduce the information presented in section 4.3 above.

Two further letters, A or F, were, in some cases, suffixed to the code. 'A' was used in the case of pupils who had lived abroad and 'F' for farmer's children. Thus a respondent coded mRUR214A would be an Afrikaans speaking boy from a rural school whose home town was now either Pietermaritzburg or Durban, but who had had a predominantly rural upbringing. He would at some stage of his life have lived abroad. FRRR124F would be an English speaking girl whose life experience was predominantly rural and whose father or mother was a farmer.

This method of coding allowed rapid and easy access to, and isolation of, any particular sub-group being examined or analysed, a process made easier still by the transference of the responses of all non open-ended questions onto 31 master sheets structured by pupil and question. These were summarised and used to build information on sub-groups. All open-ended questions were summarised and categorised according to the use to which they were to be put.

The system of basic groupings was used for the initial grouping of raw data, particularly in the case of controlled responses. From them any further combinations required, such as total U, total E, total RA, total ♀ etc. could be built or extracted. Where it is considered

appropriate, results are also presented in this form, although the normal method of presentation is in what are termed standard groupings and selected groupings (refer to Table 4.2).

Various statistical techniques were employed in the treatment of data, details of which are discussed where they are used. A general word of caution concerning statistical confidence limits is however necessary. Although the total sample size is within reasonable statistical limits, when it is subdivided, the actual numbers of pupils involved sometimes become very small and any inference thus correspondingly unreliable. While small numbers may indicate a trend and often suggest an area for further investigation, their use for any comparative purposes must be regarded with a great deal of circumspection — an attitude adopted throughout the analysis of the results.

To facilitate reading of the text, both questions and accompanying verbal instructions (AVI) are quoted directly or indirectly from the questionnaire and the verbal instructions schedule (Appendix B). This is done, in English only, at the beginning of the section where each question is discussed. Afrikaans equivalents used may be found in Appendix B. Percentages given in the text refer to the number of respondents to the particular aspect of the question(s) under discussion, unless stated otherwise.

There are a total of 87 tables in the text and attention is drawn to certain aspects concerning their presentation and layout. In most tables, designated by the term (%N/n) in the title, figures in the total column are a percentage of N, where N is the total number of respondents to the question(s) being dealt with. The term n represents the number of respondents in any sub-group or combination (e.g. A, UE, RM) or response category. Total n therefore equals N, which it will be readily noted, is always close to 100% of the sample. In some tables percentages and actual numbers of pupils are given alongside each other where it was considered necessary to illustrate a particular situation. Any tables or parts of tables deviating from these patterns are clearly indicated as such in the title.

Finally, the results of Section B of the questionnaire are presented

before those of Section A. This was always the intention, but the IBE assessment was placed first in the questionnaire in order to allow pupils to 'warm up' on questions to which, in most cases, they would automatically know the answer.

#### 4.5 Reliability and validity

It is commonplace among statisticians that every obtained test score is influenced by chance errors. Following Lewis (1967), these would vary between individuals on the same test at the same time, and for the same individual on identical tests on different occasions. They are also a function of the number of items in a test. Although these errors, which may be positive or negative, are in the long term compensatory, because they constantly occur, it is necessary to recognise a built-in element of inaccuracy or unreliability, no matter how small, in every test and score. Thus Maldague (1976, p.195) defines reliability as "the stability with which a test measures variables at determined intervals", while Roscoe (1975, p.102) describes it as "the notion of the true score variance to the observed score variance". Theoretically the coefficient of reliability ( $r_{tt}$ ) may be expressed as the relationship between repeated tests i.e.

$$r_{tt} = \frac{\sigma_t^2}{\sigma_o^2}$$

where  $\sigma_t^2$  is the true variance and  $\sigma_o^2$  the observed variance (Lewis, 1967, p. 185). In the nature of this study however there are no repeated tests for comparison so that any reliability test inevitably devolves upon a test of internal consistency. For this purpose the split-half coefficient of reliability ( $r_{\frac{1}{2}\frac{1}{2}}$ ) where two halves of the same sample are compared, is utilised in the treatment of the CAWT and IBE scores (Lewis, 1967, p.189).

Following Lewis (1967, p.190):

"... the validity of a test may be regarded as the extent to which it measures what it is intended to measure ... A test cannot have high validity without correspondingly high reliability. On the other hand a high reliability is not itself a guarantee of high validity. Generally a measure of validity in the form of a coefficient of validity would be obtained by correlating test scores with scores obtained from the same group of testees on some agreed criterion test."

As we do not yet have such a criterion test against which to validate our responses, they are inevitably prey to subjectivity. Some relief is offered however by Cronbach and Meehl (1955) who, in their concept of construct validity stress that for whatever reason or purpose a test is being used, what is most important is an understanding of what the test score means. Understanding and appraisal of the test result and what it measures can only stem from knowledge of the whole network of relationships into which it fits. Upon this basis it can be argued that scores for Section A of the questionnaire will have high construct validity as long as they are viewed only as a measure of the pupils' conservation orientated background. For any other aspect of background the scores can at best offer only a clue. Similarly Section B would only have construct validity if the questions are seen as a test of knowledge and understanding of some selected ecological and conservation concepts and no more.

Finally it should be pointed out that although attempts were made during the pre-testing of the questionnaire to reduce unreliability and invalidity to the minimum, several of the questions (e.g C19, C21 and D2) are, in the final analysis, still considered to be either very unreliable or of dubious validity. These problems are dealt with under the analysis of the questions concerned.



## CHAPTER 5 THE CONSERVATION AWARENESS TEST

The purpose of the CAWT was twofold. Primarily it was to obtain a conservation awareness score for each pupil in the sample group, which could then be treated statistically to provide an index of conservation awareness for the sample group as a whole. This could then be compared with the IBE scores obtained from section A as well as individual questions in sections A, C and D. The secondary purpose of the CAWT was to test the sample group's knowledge of and attitudes to a selected number of individual ecological and conservation concepts. Thus each question comprising the test had an intrinsic value as well as a contributory value to the score of the test as a whole. Although not the original intention, the CAWT was also administered to a small group of teachers, relevant details being covered in section 5.5 below.

### 5.1 Development and construction

Having established the purpose of the CAWT and the principles of content and structure within which it was intended to operate, the next step was to decide which ecological and conservation concepts should be included in order to embrace both a fair coverage and to test pupils on what they might reasonably be expected to be familiar with. After wide consideration, including examination of syllabi and a review of literature and opportunities generally available in the field, eight groups of concepts were chosen for development into the 12 questions comprising the CAWT. These concepts are listed together with the numbers of related questions in Table 5.1. It will be noted that there is considerable overlap as all questions embrace more than one concept. While it may be argued that each question should have been concerned with only a single concept, the specific items of knowledge which this would in many cases require was considered unreasonable for the target group.

Scoring was based on two points per question, except for B5 for which there were three points, giving a total of 25. One point was allocated for the ecologically and conservationally correct response to each controlled question and one point was accorded for each 'valid' answer to an open-ended question. Validity in this sense was defined in terms

TABLE 5.1 THE GENERAL RELATIONSHIP OF ECOLOGICAL AND CONSERVATION CONCEPTS TO QUESTIONS IN THE TEST

CONCEPT	RELATED QUESTIONS										
Food chains, trophic levels and nutrient cycles	2	3	4	5	6	7				10	
Niche and function	2	3	4	5	6	7				11	12
The value of indigenous flora								8	9		
The aesthetic aspect of conservation			4					8		11	12
The rational versus the sentimental approach	1			5						10	
Environmental management and control							7		9		
The term <u>wildlife conservation</u> and its closest Afrikaans equivalent, <u>natuurbewaring</u>	1		4		6						
Habitat	1							8	9	10	11

of whether the answer related to the correct controlled response and whether it was ecologically and conservationally sound. Therefore by definition an incorrect response to the controlled question could not have a valid reason for purposes of the test score.

## 5.2 Individual question analysis

In this section individual questions constituting the CAWT are analysed in terms of their rationale and the results which they produced.

### 5.2.1 Question B1: What do you understand by the term "wildlife conservation"?

This open-ended question was designed to allow pupils to express their opinions of what 'wildlife conservation' is about before being subjected to suggestions and stimuli in the rest of the questionnaire. The answer sought was to embrace one or more of the following concepts, for which either one or two points, depending on clarity and exposition, would be awarded:

- a. A clear expression of the term 'conservation' as the wise use of resources as opposed to preservation or non-use of resources.
- b. The prevention of the extinction of wildlife (fauna and flora) for economic, scientific, recreational or aesthetic reasons\*.
- c. The conservation of various habitats as a pre-requisite for the survival of wildlife.

The results of the answers, which were attempted by all 306 pupils in the survey, are shown by basic and standard grouping in Table 5.2. Overall, only a small proportion (7,19%) of the sample failed to have any understanding of what 'wildlife conservation' (natuurbewaring) is about. A substantial minority (37,58%) had a clear understanding, while over half (55,23%) had a partial understanding. From a conservationist viewpoint any tendency to view this as a heartening picture might be tempered by considering whether the adage of a little knowledge being a

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\* Reasons for wildlife conservation are examined in greater detail under the heading 'Why conserve wildlife' in Chapter 8.

TABLE 5.2 NUMBERS OF PUPILS SCORING 0, 1 AND 2 ON QUESTION B1 BY STANDARD AND BASIC GROUPING

SCORE	n	% of N	U	R	♂	♀	A	E	Um	Uf	Rm	Rf	UM	UF	RM	RF
a 0	22	7,19	15	7	18	4	7	15	6	0	1	0	7	2	4	2
b 1	169	55,23	107	62	87	82	71	98	15	28	15	13	31	33	26	8
c 2	115	37,58	75	40	52	63	44	71	10	18	4	12	22	25	16	8
n(a+b+c)	306	100	197	109	157	149	122	184	31	46	20	25	60	60	46	18
Average Score*	1,30		1,30	1,30	1,21	1,39	1,30	1,30	1,13	1,39	1,15	1,48	1,25	1,38	1,46	1,33

\* Calculated as  $\frac{b + 2c}{n}$

N = 306

dangerous thing might not have some applicability.

Further examination of the results in terms of sub-groups show a remarkable equivalence in the average scores of U/R and A/E pupils. Differences are however evident between males and females, a point amplified by examination of average scores based on basic grouping. Standard statistical methods (Lewis, 1967; Moroney, 1968) were used to test the statistical significance of the observed differences\*. Postulating the null hypothesis ( $H_0$ ), the critical ratio,  $t$ , (using Student's  $t$ -test) worked out at 2,68, resulting in the rejection of the  $H_0$  at the 99% level of confidence and thereby indicating that the observed differences were likely to occur by chance less than once out of 100 times. The implication is thus that females in the target group are more likely to have a better understanding of the concept than their male counterparts.

5.2.2 Question B2: What is the normal food eaten by;  
 Baboons?  
 Antelope?

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* mean ( $m_1$ ) of ♀ = 1,39	$\sigma = 0,5411$
	$\sigma_{m_1} = 0,0444$
mean ( $m_2$ ) of ♂ = 1,21	$\sigma = 0,6316$
	$\sigma_{m_2} = 0,0505$

The standard error of the difference of the two means is;

$$\begin{aligned} \sigma_{m_1 - m_2} &= \sqrt{(\sigma_{m_1})^2 + (\sigma_{m_2})^2} \\ &= 0,0672 \end{aligned}$$

Calculating the critical ratio,  $t$ , which is the ratio of the difference between the means to the standard error of the difference

$$\begin{aligned} t &= \frac{m_1 - m_2}{\sigma_{m_1 - m_2}} \\ &= 2,68 \end{aligned}$$

A straight test of factual knowledge in which the food requirements of one commonly known species of mammal, the baboon (Papio ursinus), and one commonly known mammal group, the antelope (Bovidae), was sought. Acceptable answers were:

For baboons; omnivore, roots, tubers, fruit, berries, scorpions or any equivalent terms.

For antelope; herbivore, grass, leaves, vegetation or equivalent terms.

The results are shown in Table 5.3 below.

TABLE 5.3 PERCENTAGE OF CORRECT ANSWERS TO QUESTION B2 BY STANDARD GROUPING (%N/n)

SUBJECT	TOTAL	U	R	♂	♀	A	E
baboons	77,45	74,62	82,57	83,43	71,14	85,24	72,28
n	237	147	90	131	106	104	133
antelope	91,83	89,84	95,41	94,90	88,59	92,62	91,30
n	281	177	104	149	132	113	168

N = 306

All pupils answered both parts of the question, but the proportion of correct answers for the antelope was 14,38% higher than for baboons. This was a little surprising considering that the baboon/bobbejaan features as a regular character in South African literature, particularly in Afrikaans, which would however explain the better performance by the Afrikaans sub-group. The catholic tastes of baboons also allowed for intelligent guessing, but three interesting inaccuracies repeated themselves.

- a. Durban pupils frequently gave 'bananas' or 'piesangs' as their answer, indicating confusion with vervet monkeys (Cercopithecus aethiops) and samango monkeys (C. mitis) with which they are undoubtedly more familiar. While baboons certainly eat bananas they do not at present occur in any numbers in banana growing areas, so the answer could not be accepted.
- b. 'Fleas' and more frequently 'vlooie' were given, no doubt because

those who had seen baboons and noticed their incessant grooming and defleaing activity, had assumed fleas to be their 'normal' food without further thought. This answer was not accepted.

- c. Several pupils declared 'meat' or 'vleis' to be the answer. It is difficult to assess to what extent this was a wild guess and how many may have read some of the literature on the subject\*. This answer was however marked wrong as even if the literature had been read, there was a failure to recognise it as a very unusual occurrence rather than 'normal'.

An interesting answer was given by nearly half of the pupils whose parents were farmers i.e. crops or 'mielies'. This answer was marked correct as this often does in fact become the 'normal' diet of baboons in farming areas, and the question had not stipulated game reserves.

The antelope part of the question had an interesting twist in it as there was a built-in need for English pupils to know what an antelope was as opposed to the commonly misused term 'buck'. Several pupils appear to have fallen down for this very reason, with no fewer than 14 giving 'ants' as the answer. The Afrikaans term 'wildsbok' is far closer to the commonly used 'bok' and 'miere' did not occur.

In general rural pupils performed better than their urban counterparts, Afrikaans pupils better than English pupils and males better than females, in most cases by substantial margins. No major conclusions or inferences can be drawn from this question other than that it does indicate that the vast majority of the sample group possessed some knowledge of what wild animals eat. This is a first step towards understanding the concepts of trophic level, food chains and nutrient cycles.

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\* Eugene Marais (1940, 1969), in his extensive observations on baboons, recorded rare occasions on which baboons ate meat. More recently in an article in the National Geographic Magazine, Strum (1975) referred to occasional meat eating by a group of East African baboons. There may also have been confusion with van Lawick-Goodall's (1971) much publicised chimpanzees (Pan troglodytes) which also sometimes ate meat. This is likely, as a film mentioning this is available from the Natal Parks Board and has been shown in many Natal schools.

5.2.3 Question B3: Do you think the hyena serves any useful purpose?  
If you said 'Yes' then explain what.

This is the first of the questions requiring both a controlled and an open-ended response. The hyena\* was specifically chosen as a test of food chains, niche and ecological function, as in common lore and popular writing it has generally received unfair and unfavourable treatment. Often described in terms such as 'evil', 'repulsive' or 'afskuwelik', the creature has been surrounded by more myth and nonsense than any other mammal — with the possible exception of the wolf (Canis lupus), its holarctic counterpart in 'villainy'! Only in relatively recent times have the role and behavioural attributes of the hyena become known, even to science (van Lawick-Goodall, 1970; Kruuk, 1972). Thus, it was assumed, a YES response would indicate not only factual knowledge of the matter, but that relatively updated information on conservation was percolating through to pupils at school level, potentially displacing both ignorance and misconception.

Referring to Table 5.4, which summarises the results of the controlled responses, a surprising 84,72% of the sample appreciated the role of the hyena, but what is more important, is that 88,6% of these (226/255) were able to offer a valid reason. The small proportion of NO answers is particularly pleasing from a conservationist point of view and the writer would contend that had this test been applied to a similar sample 10 years ago or to the older generation today, the proportion of NO responses would have been much higher, if not overwhelming. Some evidence for this exists in the teacher's test where only 6 (24% of N) answered YES.

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\* In English, the general term 'hyena', normally refers to the 'spotted hyena' (Crocuta crocuta). Allowance was made for the fact that it could be confused with the 'striped hyena' (Hyaena hyaena) or 'brown hyena' (H. brunnea) whose diets and ecological niche are different from that of the spotted hyena. The same problem does not arise in Afrikaans where, following Schoeman (1976) 'hiëna' refers specifically to the species C. crocuta. The brown hyena is known as the 'strandwolf', 'bruinwolf' or 'strandjut' while the striped hyena is known as the 'aardwolf' or 'maanhaarjakkals'. Where Afrikaans pupils were not familiar with the uncommonly used term 'hiëna' and queried it, the more colloquial alternatives of 'tierwolf' and 'geflekte wolf' were offered.



TABLE 5.4    RESPONSES TO QUESTION B3 BY STANDARD AND SELECTED GROUPING (%N/n)

RESPONSE	TOTAL	U	R	♂	♀	A	E	UA	RA	UE	RE	n
YES	84,72	86,08	82,24	93,46	75,68	85,00	84,53	86,84	81,82	85,59	82,54	255
NO	3,32	3,09	3,74	1,30	5,40	4,16	2,76	1,32	9,09	4,24	0,00	10
NOT SURE	11,96	10,82	14,01	5,23	18,92	10,83	12,70	11,84	9,09	10,17	17,46	36
n	301	194	107	157	148	121	184	76	45	120	64	

N = 301

Differences in response patterns between U/R and A/E sub-groups are on whole small, but there is a substantial difference between males and females. The 17,78% difference in YES responses is however largely taken up by the UNSURE differences, 13,69%, so that even in females the NO vote is very small. Looking at the selected grouping, it is interesting that the highest NO score is among the RA and the lowest among RE sub-groups, while the situation is partially reversed for the UA and UE sub-groups.

In the open-ended part of the question, by far the most common valid reason given related to the hyena's role in cleaning up carcasses and thus preventing the spread of disease. The most common invalid reasons supplied were that the hyena was the major control over animal numbers, that it provided other animals with food and that it was 'part of nature'.

5.2.4 Question B4: Do you think it would matter if the South African Black Eagle became extinct?  
Give reasons for your answer.

This question was constructed on the premise that many people, both worldwide and in South Africa, still regard birds of prey (Afrikaans = roofvoëls) primarily as pests and are often totally unaware of their ecological role at the top of the food chain, where they serve as important indicators of well balanced and healthy ecosystems (Brown, 1972, 1976; Dorst, 1973; ICBP, 1975; Siegfried et al., 1976). The spectacular Black Eagle (Aquila verreauxi) (Afrikaans = Witkruisarend) was chosen, as opposed to a general grouping like eagles or hawks, as it was thought it would be one of the best known specific raptors. Despite this choice however, pupils in all but two of the classes visited, asked when the question was read out, whether this was a 'trick question' or whether there was in fact such a 'thing'. At the time a simple "No it is not a trick question" reply was given to this query.

Because of widely varying response patterns, the results of the first part of the question are presented by basic as well as standard and selected grouping, in Tables 5.5 and 5.6 respectively. The major feature is undoubtedly the overall high proportion of NOT SURE responses; in only

TABLE 5.5    RESPONSES TO QUESTION B4 BY BASIC GROUPING (%N/n)

RESPONSE	TOTAL	Um	Uf	Rm	Rf	UM	UF	RM	RF	n
YES	64,92	80,64	71,11	50,0	36,0	75,0	65,00	67,39	38,89	198
NO	6,23	9,68	2,20	10,0	8,0	5,0	6,67	8,70	0,00	19
NOT SURE	28,85	9,68	26,67	40,0	56,0	20,0	28,33	23,91	61,11	88
n	305	31	45	20	25	60	60	46	18	

N = 305

TABLE 5.6 RESPONSES TO QUESTION B4 BY STANDARD AND SELECTED GROUPING (%N/n)

RESPONSE	TOTAL	U	R	♂	♀	A	E	U♂	U♀	R♂	R♀	FARMER'S CHILDREN	n
YES	64,92	71,94	52,29	70,70	58,78	62,81	66,30	76,92	67,62	62,12	37,21	79,20	198
NO	6,23	5,61	7,34	7,64	4,73	6,61	5,98	6,60	4,76	9,09	4,65	16,67	19
NOT SURE	28,85	22,45	40,37	21,66	36,49	30,58	27,72	16,48	27,62	28,79	58,14	4,16	88
n	305	196	109	157	148	121	184	91	105	66	43	48	

N = 305

two categories (Um and U♂) falling below 20%. To what extent this reflects uncertainty about the bird's existence, as evidenced above, as opposed to the possibilities of it becoming extinct, cannot be judged. One might also be tempted to surmise that the results represent a transition period in attitudes from raptors being historically 'bad' to becoming recognised as having some sort of undefined role to play. One is also tempted to ask how the responses might have differed, particularly amongst females, had the subject been a more colourful, familiar or exotic bird rather than a raptor with its martial and rapacious connotations.

Another interesting feature of the results are the contrasting responses between the U/R and ♂/♀ sub-groups. In all respects urban pupils perform better than their rural counterparts, which considering that most birds of prey live and operate in the countryside, would be a singularly disturbing feature, were it not overwhelmingly countermanded by farmer's sons and daughters. In the countryside, where raptors suffer the greatest potential persecution, 38 out of 48 responses of farmer's children were positive and only two negative.

Males offered both a substantially higher YES vote and a slightly higher NO vote than females, the differences being accounted for in the latter's much higher degree of uncertainty. Combining sex with urban and rural sub-groups a somewhat mixed bag results, but urban males perform best overall. Differences between Afrikaans and English speaking pupils are relatively small in all response categories.

Concerning the open-ended responses, 143 of the 198 YES answers (72,22%) were accompanied by valid reasons, most commonly relating to the aesthetic aspects of the bird, its role in rodent control and a sense of responsibility towards future generations. The invalid reasons given showed no pattern or trends other than gross ignorance. Finally, whatever the rationalisation for the NOT SURE responses, and whichever way one looks at the overall figures, an important educational effort is needed as raptors in general, and the large ones in particular, are not common.

5.2.5 Question B5: If you had the opportunity to save a baby springbuck from a leopard without any danger to yourself, would you do it?

Give reasons for your answer.

Would you rescue a rodent about to be caught by an owl?

The question was designed to elicit both an understanding of prey-predator relationships (combining the first two concepts in Table 5.1, p.74) and the extent to which the correct response might be influenced by a sentimental or emotional rather than rational reaction. The leopard (Panthera pardus) was chosen as, despite being seldom seen or heard of, it enjoys a reputation for stealth and strength, and is occasionally the rogue of popular literature. To the average person it is something of an unknown factor in comparison for example, with lions (P. leo). The choice of a baby springbuck (Antidorcus marsupialis), known in name, if not in form, to almost everyone, was a clear counterbalance because of its emotional connotations. Pupils, once having committed themselves and given a reason for their choice, were then unexpectedly presented with the third part of the question where, although the principle is identical, the creatures involved are emotionally more neutral. If anything, the predator was likely to have the sympathetic edge due to its generally favourable portrayal in children's literature and because rodents are frequently associated with disease\*.

The correct combination to the controlled responses was a NO-NO answer, one point being allocated for each 'NO'. In retrospect, a bonus point might justifiably have been awarded for the correct combination, but this was not done. One point was awarded for a valid reason. Answers to the two controlled responses are tabulated for comparison in Tables 5.7 and 5.8

Close examination of Table 5.7 reveals both a very high proportion of

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\* In one of the pilot surveys conducted during the construction of the questionnaire, 83 standard nine boys were asked to write down the rodent which first came to mind when the word was mentioned: 53 said 'rat', 25 'mouse' and only five named a variety of other animals.

TABLE 5.7    RESPONSES TO QUESTION B5 BY STANDARD AND SELECTED GROUPING (%N/n)

RESPONSE	TOTAL	U	R	♂	♀	A	E	m	f	M	F	n
YES	59,67* (24,92)	60,71 (23,86)	57,80 (26,85)	46,15 (16,02)	73,83 (34,23)	64,75 (35,25)	56,28 (18,03)	54,90 (25,49)	71,83 (42,25)	41,90 (11,43)	75,64 (26,92)	182 (76)
NO	30,49 (63,93)	29,08 (65,99)	33,03 (60,19)	44,23 (73,08)	16,11 (54,36)	25,41 (54,10)	33,88 (70,49)	37,25 (66,66)	16,90 (45,07)	47,62 (76,19)	15,38 (62,82)	93 (195)
NOT SURE	9,84 (11,15)	10,20 (10,15)	9,17 (12,96)	9,62 (10,90)	10,06 (11,41)	9,84 (10,65)	9,84 (11,48)	7,84 (7,84)	11,27 (12,68)	10,48 (12,38)	8,97 (10,25)	30 (34)
n	305	196	109	156	149	122	183	51	71	105	78	

\* In each row the top figure refers to the first part of the question (the leopard) while the bracketed figure refers to the last part of the question (the owl).

N = 305

TABLE 5.8 RESPONSE COMBINATIONS FOR QUESTION B5 BY STANDARD AND SELECTED GROUPING (%N/n)

RESPONSE PATTERN	TOTAL		U		R		♂		♀		A		E		m		f		M		F	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
a NO - NO	82	26,89	50	25,51	32	29,36	65	41,67	17	11,41	25	20,49	57	31,15	18	35,29	7	9,86	47	44,76	10	12,82
b YES - YES	57	18,69	40	20,41	17	15,60	13	8,33	44	29,53	28	22,95	29	15,85	3	5,88	25	15,21	10	9,52	19	24,36
c NOT SURE - NOT SURE	7	2,29	5	2,55	2	1,83	4	2,56	3	2,01	4	3,28	3	1,64	1	1,96	3	4,22	3	2,85	0	0,0
d YES - NO	103	33,77	68	34,69	35	32,11	49	31,41	54	36,24	44	36,07	59	32,24	23	45,10	21	29,58	26	24,76	33	42,31
e NO - YES	5	1,64	3	1,53	2	1,83	1	0,64	4	2,68	3	2,46	2	1,09	0	0,0	3	4,22	1	0,95	4	1,28
f NOT SURE - NO	19	6,23	11	5,61	8	7,34	9	5,77	10	6,71	7	5,74	12	6,56	3	5,88	4	5,63	6	5,71	6	7,69
g NOT SURE - YES	5	1,64	5	2,55	0	0,0	2	1,28	3	2,01	2	1,64	3	1,64	0	0,0	2	2,82	2	1,90	1	1,28
h NO - NOT SURE	4	1,31	3	1,53	1	0,91	2	1,28	2	1,34	2	1,64	2	1,09	1	1,96	1	1,41	1	0,95	1	1,28
i YES - NOT SURE	23	7,54	12	6,12	11	10,09	11	7,05	12	8,05	7	5,74	16	8,78	2	3,92	5	7,04	9	8,57	7	8,97
n	305		196		109		156		149		122		183		51		71		105		78	
Consistency %*		47,87		48,47		46,79		52,56		42,95		46,72		48,64		43,13		49,29		57,13		37,18
OCR %**		42,95		43,36		42,19		39,10		46,97		45,36		40,98		52,94		42,77		32,37		52,56

\* Consistency % =  $\frac{a + b + c}{n} \times \frac{100}{1}$

\*\* OCR = one correct response expressed as a percentage of n for each sub-group.

N = 305



contradictory responses and substantial differences in the response patterns of males and females, and between Afrikaans and English speaking pupils. Differences in response between urban and rural pupils are relatively small, but within both sub-groups there is an almost complete reversal of responses, a pattern matched by the total figures. Another feature is the apparent relative consistency of the NOT SURE responses, but this is an illusion for, as Table 5.8 indicates, there is low internal consistency in this respect.

Table 5.8 highlights response patterns in terms of combinations and here too the major features to emerge are the differences between males and females and, to a lesser extent, Afrikaans and English speaking pupils. Only 11,41% of females have both answers correct compared with 41,67% for males, although the former do improve their position slightly if a single correct answer is considered ( $\sigma^{\dagger} = 80,77\%$  v  $\text{♀} = 58,38\%$ ). Afrikaans females responded incorrectly proportionately more than English females, but the latter displayed a much lower level of consistency. English males by contrast, had the highest proportion of correct answers and consistency i.e. they were the least contradictory in their responses. Overall, the English sub-group scored higher in both the proportion of correct responses and in consistency. The YES-NO responses, the classic wrong answer, is the most common in every category of sub-grouping except males, English males and Afrikaans females, in whose case YES-YES occurs proportionately more frequently, thus concurring with their high consistency rating.

Looking at the sample as a whole, there was an overwhelmingly 'unecological' response; only 26,89% answered NO-NO and 69,51% (212/305) failed to give the correct answer to the first part of the question. The responses to the owl aspect were considerably better, but at 63,93% correct, still a very poor showing on so basic a principle. If one were to assume the 'owl score' to be a 'true' reflection of awareness, then the difference between it and the 'leopard score' could be regarded as a rough 'coefficient of sentimentality'. The extent to which this was due to the baby tag or the fact that the springbuck is our national animal totem, is difficult to determine. It is probably a combination of the two and it would be an interesting exercise to compare the responses on a less emotive animal such as an impala or a steenbuck, with and without the 'baby'

prefix which may have influenced females in the sample more strongly than the males.

Analysis of the open-ended responses provide further insights. The proportion of valid reasons to YES responses appeared, at 74,19% (69/93), to be relatively high, but when expressed as 22,62% of the total sample, it is very low. The majority of reasons given centred on three sound points: the leopard's food requirements, natural selection and animal population control. One perceptive pupil pointed out that "a person would always risk danger taking food from a hungry leopard." Of the 236 invalid reasons, the most common approximated to: 'I would be too scared', 'I would not know what to do', 'I love animals', 'My maternal instinct' and 'Animals are helpless'. Possibly the final word should go to the pupil who wrote as a reason for her YES response, "The leopard will get food elsewhere where I can't see it."

5.2.6 Question B6: Do you think it is as important to protect the small mammals as the large ones?  
Why?

The purpose of the question was to determine whether there was an awareness of the ecological role played by the smaller mammals and therefore, indirectly, recognition of food chains and nutrient cycles. Because of Africa's great variety of large mammals, the smaller ones have, until comparatively recently, tended to be overlooked by both scientists and the public alike. Ample evidence of this is to be found in any survey of literature concerning African wildlife. Interestingly a not dissimilar situation exists in Europe (Trotman, 1978). From a conservationist stance, a YES response would indicate both a move in the direction of greater awareness and that recent changes in the interest and knowledge of animal scientists are filtering through to school level.

The results of the first part, responded to by 303 pupils, are summarised in Table 5.9, which indicates an overall YES response of 87,46%. This high positive result is moreover relatively uniform and irrespective of the way the total is subdivided, it remains above 80%. The following points are however noteworthy:

TABLE 5.9 RESPONSES TO QUESTION B6 BY STANDARD AND SELECTED GROUPING (%N/n)

RESPONSE	TOTAL	U	R	♂	♀	A	E	UA	RA	UE	RE	m	f	M	F	FARMER'S CHILDREN	n
YES	87,46	89,18	84,40	86,54	88,43	93,39	83,52	96,05	88,89	84,75	81,25	94,12	92,86	82,85	84,42	77,55	265
NO	5,94	4,12	9,14	7,05	4,76	2,48	8,24	1,32	4,44	5,93	12,50	0,00	4,29	10,48	5,19	14,29	18
NOT SURE	6,60	6,70	6,42	6,41	6,80	4,13	8,24	2,63	6,67	9,32	6,25	5,88	2,86	6,67	10,39	8,16	20
n	303	194	109	156	147	121	182	76	45	118	64	51	70	105	77	49	

N = 303

- a. In contrast to question B4, there is a high degree of concurrence between males and females.
- b. Afrikaans speaking pupils responded considerably more positively than English speaking pupils. Why this should be so is not clear, but it is suggested that part of the reason may lie in the greater 'exposure' of small mammals in Afrikaans literature and folklore.
- c. Urban pupils were more positive in their response than rural pupils. Although one may be inclined to view the result of farmer's children as having a depressing effect upon the rural score, this is not entirely true, as nearly one third ( $n = 15$ ) of farmer's children are in urban schools. There is also no significant difference in response pattern between urban and rural farmer's children, although proportionately they have a slightly less impact upon the urban score. Sight must also not be lost of the fact that the scores achieved by farmer's children are high anyway and that we are talking in purely relative terms. The high figure is gratifying as, in the case of raptors, the future existence of all wildlife outside of reserves depends heavily upon the attitudes of farmers.

The high YES percentage is given considerable weight by the proportion and quality of valid reasons accompanying it i.e 69,81% (185/265); the majority relating either to the position of small mammals in the food chain or the recognition that they have an ecological role and purpose. A vague ethical notion of 'equal rights for all animals' also occurred on several occasions. Analysis of the 27 invalid reasons given brings to light an interesting misunderstanding i.e. the interpretation by both Afrikaans and English speaking pupils of the word 'small' to mean 'young'. Examples were: 'they are at the beginning of the life cycle', 'species will become extinct as the young cannot breed' and 'while mammals are small, they still need adult support'. This factor must, to some extent, cast doubt, even if minimal, on both the numerical and construct validity of the YES responses. A sentimental reaction to the word 'small' might also have played a role.

5.2.7 Question B7: Would you support a campaign to permanently exterminate all caterpillars in South Africa?  
Give reasons for your answer.

The question was intended to test awareness of life cycles and ecological webs (Collis, 1978; Trotman, 1978). While the reduction or extermination of certain pests is considered an integral part of man's behaviour, the operative word was 'all', which was stressed in the administration of the questionnaire. In fact, if all caterpillars existing at any one time were to be destroyed, the world would suffer an ecological disaster of unthinkable proportions. Many of our most useful, beautiful and harmless insects, as well as the harmful ones, go through a caterpillar stage during their life cycle and insects also hold an important place in the food chain. One point was allocated for the correct response, NO, and one point for a valid reason.

The results of the controlled responses, summarised in Table 5.10 are, from an ecological viewpoint, distinctly disturbing: 17,11% i.e. one pupil in six, stated YES, while a further 20,39% (80/302) were uncertain. Of even greater significance is the proportion of farmer's children in these two categories. Truly, as Don Marquis' archy the cockroach remarked:

"i will admit that some  
of the insects do not lead  
noble lives but is every  
mans hand to be against them"  
(From, pity the poor spiders).

The major variations in response patterns occur between the U/R and A/E sub-groups. In the case of rural pupils this may be partially explained by looking at the results in conjunction with questions B4 and B6. A thread linking all three sets of responses is the perceived 'pest' aspect of the creatures concerned. For those living on farms or in small country towns largely dependant on surrounding farms for their existence, this factor may at times loom large and is nearly always present, particularly in the case of insects. It mitigates, but does not excuse, the lack of fundamental knowledge embodied in the responses.

Referring to the substantial disparities between Afrikaans and English speaking pupils, the writer is unable to offer any explanation other than that there appears to be a general dearth of relevant literature available

TABLE 5.10    RESPONSES TO QUESTION B7 BY STANDARD AND SELECTED GROUPING (%N/n)

RESPONSE	TOTAL	U	R	♂	♀	A	E	UA	RA	UE	RE	FARMER'S CHILDREN	n
YES	17,11	12,82	24,77	16,67	17,56	28,93	9,29	22,37	40,00	6,72	14,06	27,66	52
NO	62,50	67,69	53,21	64,10	60,81	45,45	73,77	55,26	28,89	75,63	70,31	59,57	190
NOT SURE	20,39	19,49	22,02	19,23	21,62	25,62	16,94	22,37	31,11	17,65	15,63	12,77	62
n	304	195	109	156	148	121	183	76	45	119	64	47	

N = 304

in Afrikaans. Given the information available from Chapter 6, and what is known of pupils' reading habits, this can at best only be a partial explanation and possibly the answer lies deeper in the cultural psyche of the sub-group. Combining language with the U/R factor the situation is further compounded with the RA and UE groups being at the opposite ends of the spectrum.

The fact that pupils who have done at least a two year course in general science (standard six and seven) in addition to any primary school nature studies, should hold the views expressed above, prompted an analysis of the declared responses in relation to the three environmental subjects, agriculture, biology and geography, taught at Natal schools (refer to question A3 in Chapter 6). 246 pupils were affected and the results are summarised in Table 5.11.

The first point which emerges is the near to perfect positive correlation of the total column with the total column of Table 5.10, indicating that the 58 respondents who did not take one of the three subjects did not differ substantially in their responses from those who did. The second significant feature is that those pupils studying agriculture as a subject performed best overall with not only the highest proportion of correct responses, but with less uncertainty. As all agriculture pupils were farmer's sons, the interesting situation occurs that while farmer's children as a sub-group score below average, those of them studying agriculture score above average, thus placing the remainder of the sub-group in an even poorer light. These poor results were fairly evenly spread over all other sub-cultural groups. The implication of this analysis is that school subjects can be a major influence upon a healthy or sound conservation attitude, but that neither geography or biology nor a combination of them appear to have as much influence on this particular question as agriculture does.

On a more optimistic note, 77,89% of those responding correctly (48,68% of the sample) gave a valid reason. There was wide recognition of the life cycle, food chains and the aesthetic component. Invalid reasons were largely irrational, composed of phrases such as 'I hate ...', 'I'm not interested ...', 'they don't deserve ...' etc. The ultimate prize however must go to the farmer's son who, in giving his reasons for stating NO,

TABLE 5.11 RESPONSES TO QUESTION B7 IN RELATION TO SUBJECTS CURRENTLY BEING STUDIED (%N/n)

RESPONSE	TOTAL	GEOGRAPHY ONLY	BIOLOGY ONLY	GEOGRAPHY & BIOLOGY	AGRICULTURE*, GEOG. & BIOL.	n
YES	17,07	15,62	19,23	16,82	17,64	42
NO	62,60	62,50	59,62	62,83	70,59	154
NOT SURE	20,32	21,88	21,15	20,35	11,76	50
n	246	64	52	113	17**	

\* In all cases agriculture was studied together with geography and biology.

\*\* All were farmer's children.

N = 246



declared "These machines do a lot of manpower work. We wouldn't be as advanced nowadays if we didn't have these machines i.e. making of dams and bridges".

5.2.8 Question B8: Do you think it matters if pine trees grow in our nature reserves?

Why?

Questions B8 and B9 set out to measure a sense of value for and appreciation of South Africa's exceptional indigenous flora and, to a lesser extent, awareness of habitat destruction. To some extent the answers to both questions depended on the knowledge that the continued existence of several of our veld types is threatened and that our natural flora now covers a small fraction of its former extent (Hall, 1976; Huntley, 1978). It was accepted that these problems are not generally perceived to be as acute in Natal as in other parts of the country. Pine trees are, for example, seen there in a very different light to the way they are viewed, ecologically, in the Cape mountains. The questions also assumed an understanding of what was meant by the terms indigenous and exotic but in retrospect this may have been asking too much.

Pine trees were chosen as the best and most widespread example of exotic vegetation. It was assumed that everyone would know that 'Xmas' trees come from northern lands and that judgement would be based on both aesthetic and scientific components, probably internalised more simply as to whether they 'belong' or not. In the administration of the question it was stated specifically that there was no objection to the commercial cultivation of pines, thus by implication excluding the utility factor from consideration. The possibility of referring to wattles rather than pines was considered, but the researcher suspected that as wattles are closely related to indigenous acacias and are easily confused in appearance, that many pupils might not in fact realise that they are exotic.

The results of the controlled responses, illustrated in Table 5.12, indicate that a substantial majority (65,23%) either feel it does not matter or are uncertain whether it does or not, although the high proport-

TABLE 5.12    RESPONSES TO QUESTION B8 BY STANDARD AND SELECTED GROUPING (%N/n)

RESPONSE	TOTAL	U	R	♂	♀	A	E	m	f	M	F	AGRIC. PUPILS	n
YES	34,77	34,72	34,86	40,65	28,57	31,67	36,81	33,33	30,43	44,23	26,92	52,94	105
NO	38,74	41,45	33,94	35,48	42,18	45,00	34,62	43,13	36,38	31,73	38,46	5,88	117
NOT SURE	26,49	23,83	31,19	23,87	29,25	23,33	28,57	23,53	23,19	24,04	34,62	41,18	80
n	302	193	109	155	147	120	182	51	69	104	78	17	

N = 302

ion of NOT SURE responses among all groups indicates that the question may not have been clearly understood. Once again the major differences of opinion lie between males and females, with smaller differences between the Afrikaans and English speaking sub-groups. Interestingly the most positive response is from English males and the least positive from English females, while the highest negative rating is from Afrikaans males. While the English sub-group gave more correct answers overall, they were also less certain of their views by an approximately equivalent margin. There is no apparent reason why these differences should occur, and no clues are offered by the responses to the open-ended questions.

As pine trees are an agricultural crop, separate figures are included for pupils studying agriculture. These are surprising as they form by a wide margin the highest proportions in both the YES and the NOT SURE categories, the latter figure giving further evidence for the possibility that the question was not clearly understood. It is however a welcome sign that so small a proportion of potential agriculturists state NO!

The response to the open-ended part of the question was poor; only 48 pupils (45,71% of YES responses) were able to give a valid reason. These centred around two issues, the exotic i.e. aesthetically unpure aspect, and increasing the acidity level of the soil. Very few pupils mentioned taking over of the natural vegetation or habitat destruction. 45 invalid reasons of a great variety were offered (e.g. 'more birds will nest in them') and 209 pupils did not answer the question at all.

5.2.9 Question B9: Do you think it is necessary to have careful management and care of South Africa's different types of indigenous vegetation?  
Why?

This question was set specifically to ascertain whether there was a sense of the need for management and care of indigenous flora. The potential responses rested upon similar conditions to those described for question B8, but knowledge that all geographically limited or isolated ecosystems require some form of management would also contribute to a conservationally acceptable response i.e. YES, although it was not axiomatic that YES would

mean recognition of this fact. Responses were also dependent upon what was understood by the term management, as this was not explained in the administration of the question. There were however no queries about it. It is pertinent too, to re-affirm that what was being tested here is a principle. The question is phrased in very general terms and one might expect very varied responses from different parts of the country, depending upon factors such as obviously deteriorating veld conditions, or rapidly growing awareness of the critical state of the Cape fynbos. In the parts of Natal occupied by Whites, issues such as these are generally less obvious.

The results of the controlled responses, detailed in Table 5.13, are in sharp contrast to those for question B8. Correct responses are high for all sub-groups, the only real difference lying within the A/E sub-division. On all counts Afrikaans speaking pupils performed better than their English counterparts. Rural pupils performed slightly better than urban pupils and males better than females.

While it would thus appear that there is widespread recognition of the need for management and care (in practice not necessarily synonymous) to be extended to the natural environment, the possibility must be allowed that the terms 'indigenous'/'inheemse' were either not understood or ignored, thus allowing the concept to be transferred to vegetation of any sort. Evidence for this suspicion is to be found in analysing the open-ended answers where very few individuals showed a real understanding of either what management meant or what indigenous vegetation was. Only 30,03% (91/303) of the respondents were able to give a valid reason and of these there was a fairly wide range, the two most common relating to 'preservation for future generations' and recognition of different trophic levels. There were 119 (39,27%) invalid reasons, the most common by far relating to 'helping the farmers', while 14 pupils made mention of the Protea spp., South Africa's national flower. 93 pupils (30,69%) did not attempt an answer.

5.2.10 Question B10: Should we avoid using dead wood for firewood in national parks, nature reserves and wild places? Give reasons for your answer.

TABLE 5.13    RESPONSES TO QUESTION B9 BY STANDARD AND SELECTED GROUPING (%N/n)

	TOTAL	U	R	♂	♀	A	E	UA	RA	UE	RE	m	f	M	F	n
YES	91,75	91,24	92,66	92,26	91,22	96,69	88,46	96,05	97,78	88,14	89,06	100,0	94,29	88,46	88,46	278
NO	2,31	2,58	1,83	2,58	2,02	0,82	3,30	1,32	0,00	3,39	3,13	0,0	1,43	3,85	2,56	7
NOT SURE	5,94	6,18	5,50	5,16	6,76	2,48	8,24	2,63	2,22	8,47	7,81	0,0	4,28	7,69	8,97	18
n	303	194	109	155	148	121	182	76	45	118	64	51	70	104	78	

N = 303

Question B10 was intended to test awareness of habitat (dry or rotting logs are the normal habitat for a multitude of small creatures) and nutrient cycles, but also involves a strong emotional component in the form of the campfire. The importance of 'dead' wood in the normal functioning of ecosystems is now widely recognised and in many of South Africa's officially conserved areas, such as Kruger National Park and parts of the Natal Drakensberg, uncontrolled consumption is no longer permitted. In the long term it is important that this concept becomes both widely accepted and applied not only in 'conserved' areas but in all natural areas. Operating against it however is the psycho-emotional-aesthetic demand for a campfire, which any random set of observations would suggest could all too often more appropriately be described as a bonfire\*. Despite the difference of opinion over the matter the conservationally acceptable answer remains an uncompromising YES.

The overall result of this question is negative both for the controlled responses, shown in Table 5.14, and for the open-ended questions. The figures given suggest that the majority of the sample group were either simply not aware of the issues involved or may have been confused by the wording of the question. On the other hand, given the positive attractions of the campfire, its physical and emotional warmth, mesmerising light and shadow effects and the symbolic, but sub-conscious, association with man's primitive origins, the writer is surprised at how high the YES vote is. In short, this aspect of conservation is neither general knowledge nor public practice. It is seldom raised and hardly ever discussed in popular conservation literature, least of all at the level at which the sample group would be likely to read.

There is little difference in the response patterns of urban and rural pupils, a significant difference between males and females and a major division of opinion between Afrikaans and English speaking pupils. Although the total male sub-group performs better than females, when viewed in a sex-language combination the picture is more complex; sub-group M

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\* Even amongst the members of an organisation such as the Honorary Forest Officers in Natal, of which the writer is a member, strong controversy and at times acrimony ensues over the 'right' of individuals to have a campfire, even in areas with limited woody vegetation such as the Natal Drakensberg!

TABLE 5.14    RESPONSES TO QUESTION B10 BY STANDARD AND SELECTED GROUPING (%N/n)

RESPONSE	TOTAL	U	R	♂	♀	A	E	m	f	M	F	n
YES	37,46	37,30	37,74	41,45	33,92	19,17	49,72	16,0	21,43	53,92	44,16	112
NO	45,15	47,15	41,51	43,42	46,94	65,00	31,84	68,0	62,86	31,37	32,47	135
NOT SURE	17,39	15,54	20,75	15,13	19,73	15,83	18,44	16,0	15,71	14,71	23,38	52
n	299	193	106	152	147	120	179	50	70	102	77	

N = 299

perform better than F, but f better than m. The size of the difference between Afrikaans and English speaking sub-groups may be accounted for on three grounds other than the chance factor. There may be a hidden bias in the wording of the question, the historical-cultural symbolism of the campfire may be stronger among Afrikaans pupils or the English sub-group may have experienced greater exposure to the concept. This last possibility is considered the most likely. Verbal questioning of members of the target group in a post-test follow-up suggested that there may have been an English television programme or newspaper article on the topic, although this could not be verified.

The open-ended responses throw no further light on the subject. The two most common valid reasons, given by 17,73% (53/299) of pupils, related either to habitat conservation or the nutrient cycle. The 237 (79,26%) invalid reasons ranged from 'causing veld fires' to the wood having 'no other purpose' to 'providing oil for future generations'. Whatever else may be said, the opiate value of the fireside cannot be underestimated. In Miguel de Cervantes' ringing words "You are a King by your own Fireside, as much as any Monarch on his Throne" (Cervantes, undated, p.xix).

5.2.11 Question B11: Do you think it is necessary for city streets to have trees in them?  
Why?

The question was designed to test awareness of function (shade, cooling effect, oxygen cycle), habitat (for birds and insects) and aesthetic appeal of trees. Wheeler (1976, p.124) notes that "since the earliest times man has carried on a love-hate affair with trees. In fact you can divide people into two groups: those who like trees and those who don't." In similar vein it is accepted that the issue of trees in city streets may be viewed differently by, for example, conservationists and city engineers, or artists and sanitation departments, but within the generalities of this question the correct answer is an unequivocal YES; despite the fact that pavements may be cracked or blossoms may cause a 'mess'.

305 pupils responded to the first part of the question and 298 to the



second part, while 94,64% (247/261) of the correct answers were substantiated by a valid reason. Both in terms of responses to the open-ended section and in the proportion of valid reasons, this question gained the highest rating in the CAWT. Results of the controlled responses, shown in Table 5.15, indicate a resounding YES answer. There is little difference in the attitudes of urban and rural pupils or between males and females, but Afrikaans speaking pupils perform substantially better than their English counterparts. English males and Afrikaans females rate best in their respective language sub-groups.

The reasons attached to the YES vote are particularly interesting in that at least two of the following reasons recurred in over 75% of the answers; i.e. 'provide shade', 'makes city attractive', 'makes people aware of nature' and 'provide oxygen'. There is thus a clear appreciation of the value of trees, while the mention of oxygen provision suggests the influence of the standard six and seven general science syllabi. (Approximately half the respondents were not studying biology at the standard nine level). The most common invalid reasons offered were; 'for health' and 'they should be there'. An analysis was made of the relationship of NO and NOT SURE responses to stated parental occupation, but with the small numbers involved no discernable pattern was evident.

5.2.12 Question B12: Do you think that wild birds have a function in cities?

Explain your answer.

Notwithstanding the use of the term 'function' the question is essentially a test of aesthetic values. While it is true that some birds may help to control garden pests, others eat fruit and yet others, when congregating in large numbers (as frequently occurs in the case of European Starlings (Sturnus vulgaris), Indian Mynahs (Acridotheres tristis) and town pigeons (Columba spp.)) may justifiably be regarded as noisy or messy. Thus, despite any ecological argument to the contrary, there is a high component of personal opinion implicit in any answer and in fact one hears very strongly expressed views both for and against the issue. Responses are also likely to be coloured by the generalised nature of the question which does not specify any particular type of bird, such as

TABLE 5.15 RESPONSES TO QUESTION B11 BY STANDARD AND SELECTED GROUPING (%N/n)

RESPONSE	TOTAL	U	R	♂	♀	A	E	m	f	M	F	n
YES	85,57	86,22	84,40	85,90	85,23	95,08	79,23	92,16	97,18	82,86	74,36	261
NO	7,54	7,65	7,65	6,41	8,72	2,46	10,93	3,92	1,41	7,62	15,38	23
NOT SURE	6,89	6,12	8,26	7,69	6,04	2,46	9,84	3,92	1,41	9,52	10,26	21
n	305	196	109	156	149	122	183	51	71	105	78	

N = 305

eagles or sparrows. It is probable that there would be different reactions to different types of birds, depending on factors such as pest/non-pest perception, colour of plumage and historical image. From a conservationist view the acceptable answer to the first part of the question is YES.

The overall responses to the controlled part, as shown in Table 5.16, indicate a high degree of ambivalence and uncertainty on the issue, although as with all NOT SURE votes in the study, some allowance must be made for those who may not have understood the question. Analysis of responses by various selected groupings showed no particular patterns, but a number of points emerge from the table as it stands. Urban pupils place a higher value on birds in cities than do their rural counterparts. Possibly the latter tend to take the presence of birds more for granted. There is however no evidence of this in the open-ended responses. Farmer's children, whom one might expect to be more sensitive to the ethos of birds, perform only marginally better than the average. Male/female comparisons show a difference in response patterns similar, in some respects, to that of the Black Eagle in question B4. Possibly males are simply more interested in birds than females are.

Comparison within the Afrikaans/English sub-grouping shows that while English speaking pupils gave a higher proportion of YES answers, they also gave more NO answers, thus indicating a more definite attitude, for right or wrong, on this question. Although these differences are not great and the point should not be laboured, one must ask, in the light of both this question and question B4, what relationship might exist between the availability of published material on birds (particularly field guides) and the level of general awareness pertaining to them. There are relatively few bird books or regular publications available in Afrikaans and the question arises as to where or how the Afrikaans speaking pupils' sense of awareness is gained. Perhaps one should ask why the English score is comparatively so low, considering the substantial amount of material available to them. It is interesting too that the S.A. Ornithological Society and its constituent Bird Clubs around the country are dominated by English speakers. Not a single Afrikaans speaking pupil in the sample indicated membership of a bird club (refer to question A6).

TABLE 5.16      RESPONSES TO QUESTION B12 BY STANDARD AND SELECTED GROUPING (%N/n)

RESPONSE	TOTAL	U	R	♂	♀	A	E	FARMER'S CHILDREN	n
YES	38,08	39,90	34,86	43,87	31,97	34,71	40,33	41,67	115
NO	39,07	37,31	42,20	35,48	42,86	37,19	40,33	37,50	118
NOT SURE	22,85	22,79	22,94	20,65	25,17	28,09	19,34	20,83	69
n	302	193	109	155	147	121	181	48	

N = 302

The open-ended part of the question was poorly answered, only 62,28% (75/115) of those answering YES being able to give a valid reason. The four most commonly expressed reasons related to 'keeping in contact with nature', 'insect and rodent control', 'eating scraps of food' and 'making the city attractive'. The invalid reasons covered a vast range of guesswork and ignorance ranging from other birds controlling Indian Mynahs to somewhat vague notions of keeping the balance of nature. The most common reasons given among the 118 NO responses related to mess, noise and lice.

### 5.3 The conservation awareness scores

The conservation awareness scores, the results of the Conservation Awareness Test, were arrived at by totalling the scores for each of the 306 pupils on the basis of the mark allocation outlined in section 5.1. These were then summed up for each basic group and divided by the number (n) in the group to give an average raw score. From this the total raw score, the total average score and the raw scores for all standard and selected groupings were obtained. All raw scores were then converted to percentages as displayed in Tables 5.17 and 5.18. Individual pupil scores ranged from 16% -100%, with an overall average of 56,46% and a standard deviation of 14,11. The dispersion of the scores is shown visually for the total sample and each of the standard groupings in Figures 5.1 to 5.4, while the standard deviations are given for components of the basic, standard and selected groupings.

The negative skewing of the results of the sample as a whole (Figure 5.1) suggest that the test may either have been 'too easy' or that the general level of conservation awareness is higher than might be expected — assuming of course that one expects a normal curve with a 50% average. Comparison of Figures 5.2 to 5.4, viewed in conjunction with the averages given in Table 5.17, indicate however that not all sub-cultural groups within the sample necessarily found the test equally easy, or difficult for that matter. Viewed another way, they do not display an equal level of conservation awareness. The most striking contrast is between males and females, but there are also perceptible differences between Afrikaans and English speaking pupils.

TABLE 5.17 RESULTS OF THE CAWT BY STANDARD AND SELECTED GROUPING FOR ALL SCHOOLS IN THE SAMPLE

	TOTAL	U	R	♂	♀	A	E	UA	RA	UE	RE	m	f	M	F	'X'*	'Y'*	'Z'*
AVERAGE % (m)	56,46	56,30	56,73	60,40	52,30	53,70	58,28	55,44	52,44	57,50	59,75	57,56	50,93	61,77	53,54	63,84	55,03	65,80
STANDARD DEVIATION (σ)	14,11	14,20	13,95	15,10	12,99	12,13	15,28	12,21	11,98	15,33	15,19	11,25	12,72	16,63	13,23	15,77	15,64	19,81
n	306	197	109	157	149	122	184	77	45	120	64	51	71	106	78	49	29	17

N = 306

- \* X = Farmer's children
- Y = Pupils who have lived abroad
- Z = Pupils studying agriculture

TABLE 5.18 RESULTS OF THE CAWT BY BASIC GROUPING

	TOTAL	Um	Uf	Rm	Rf	UM	UF	RM	RF
AVERAGE % (m)	56,46	57,16	52,60	58,20	47,84	61,13	53,87	62,60	52,44
STANDARD DEVIATION (S)	14,11	10,76	13,10	11,96	12,00	16,90	13,59	16,28	11,94
n	306	31	46	20	25	60	60	46	18

N = 306

The apparently significant difference in the performances of males and females and of Afrikanans and English speaking pupils, particularly when viewed in the light of the hypotheses postulated in Chapter 1, prompted a statistical analysis of the significance of the differences between the means of the opposing standard sub-groupings. A similar method and rationale to that used in question B1 (section 5.2.1) was employed i.e. postulation of the null hypothesis ( $H_0$ ) that any differences were due to chance, and then calculation of the critical ratic,  $t$ , in order to prove or disprove this.

The information used in the calculations and the results are grouped for convenience in Table 5.19. Although strictly speaking the null hypothesis can never be accepted or rejected with complete certainty, the results indicate that in the case of:

- a. The urban/rural breakdown, we may retain the  $H_0$  with a 99% level

TABLE 5.19 INFORMATION AND RESULTS RELATING TO SIGNIFICANCE TESTS ON THE DIFFERENCE BETWEEN THE MEANS OF THE STANDARD GROUPINGS

	U	R	♂	♀	A	E
n	197	109	157	149	122	184
mean	56,30	56,73	60,40	52,30	53,70	58,28
S	14,20	13,95	15,10	12,99	12,13	15,28
S <sub>m</sub>	1,0140	1,3420	1,2089	1,0677	1,1027	1,1295
$\frac{m_1 - m_2}{t}$	1,6820	0,43	1,6128	8,10	1,5785	4,58
RESULT	0,2556		5,0223		2,9014	
	retain $H_0$		reject $H_0$		reject $H_0$	

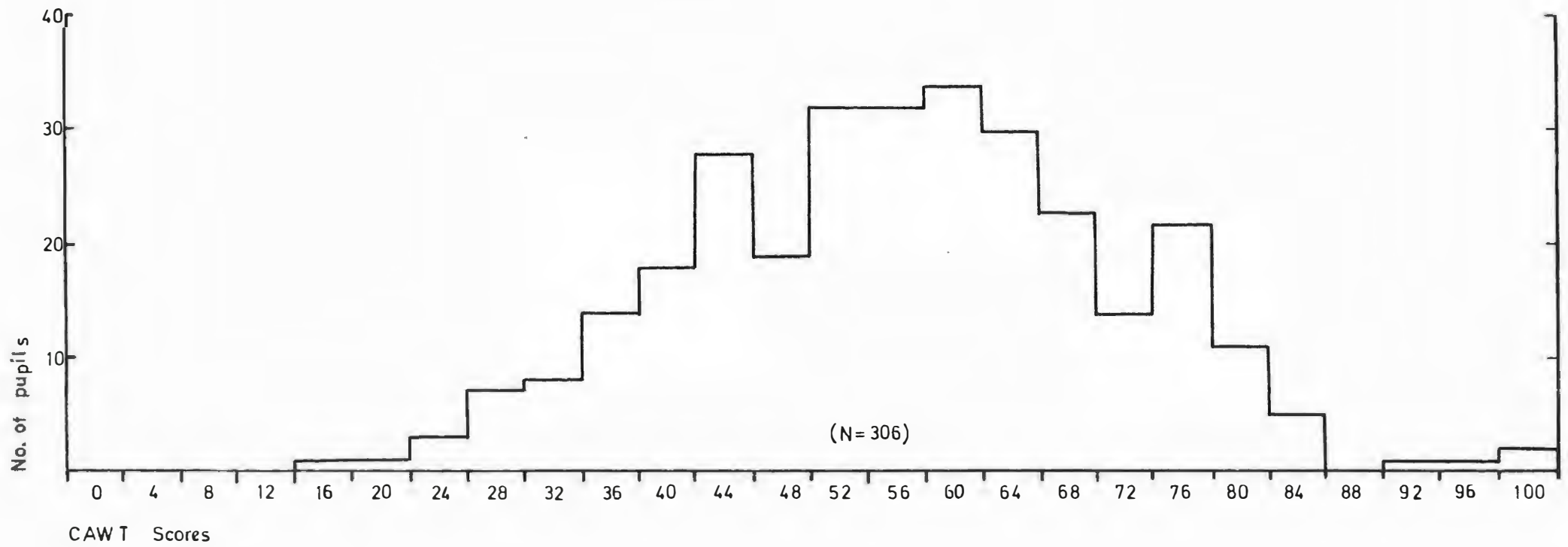


FIGURE 5.1 HISTOGRAM SHOWING DISTRIBUTION OF CAWT SCORES FOR THE TOTAL SAMPLE



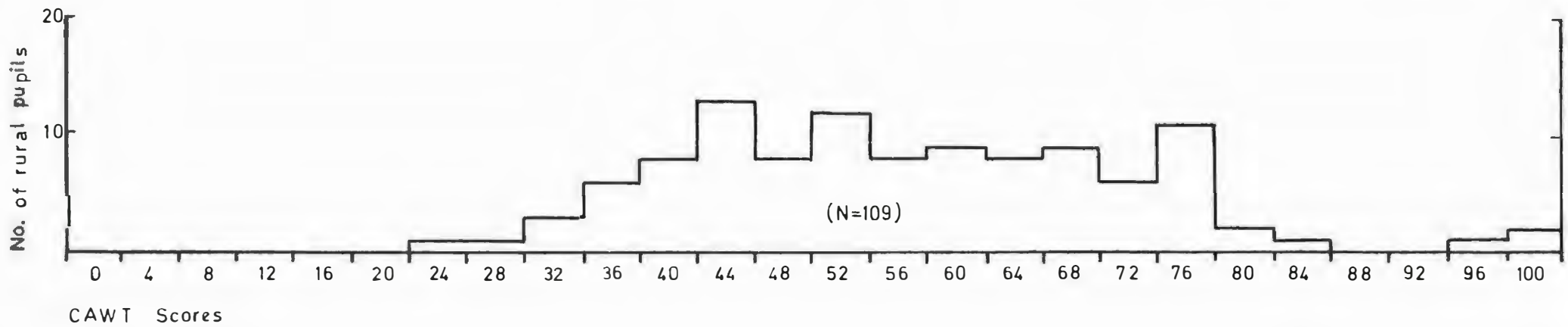
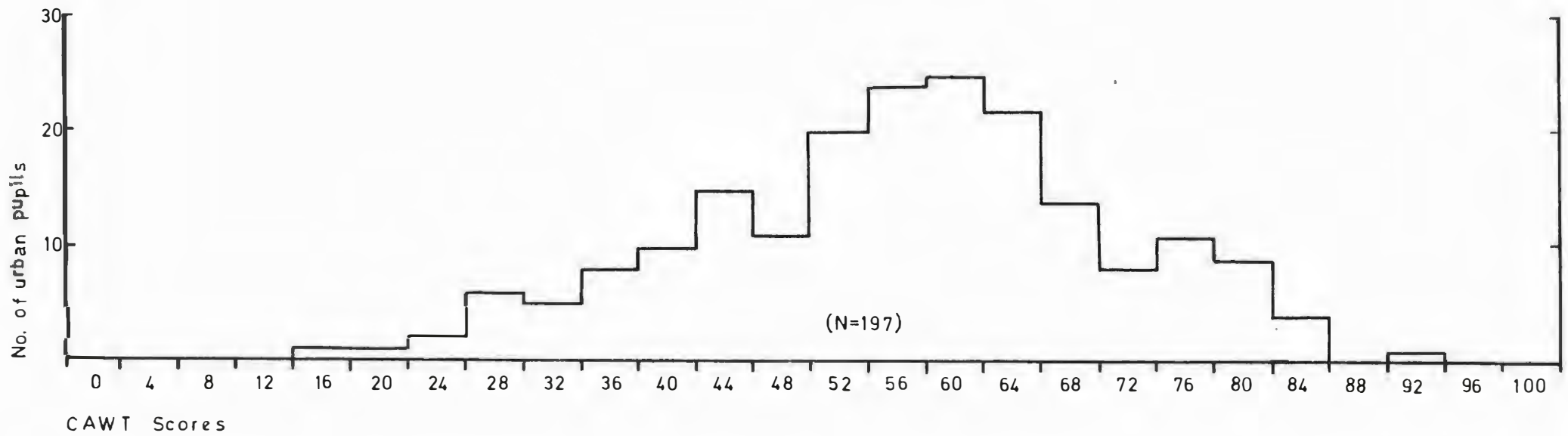


FIGURE 5.2 HISTOGRAMS COMPARING THE DISTRIBUTION OF CAWT SCORES FOR URBAN AND RURAL SUB-GROUPS

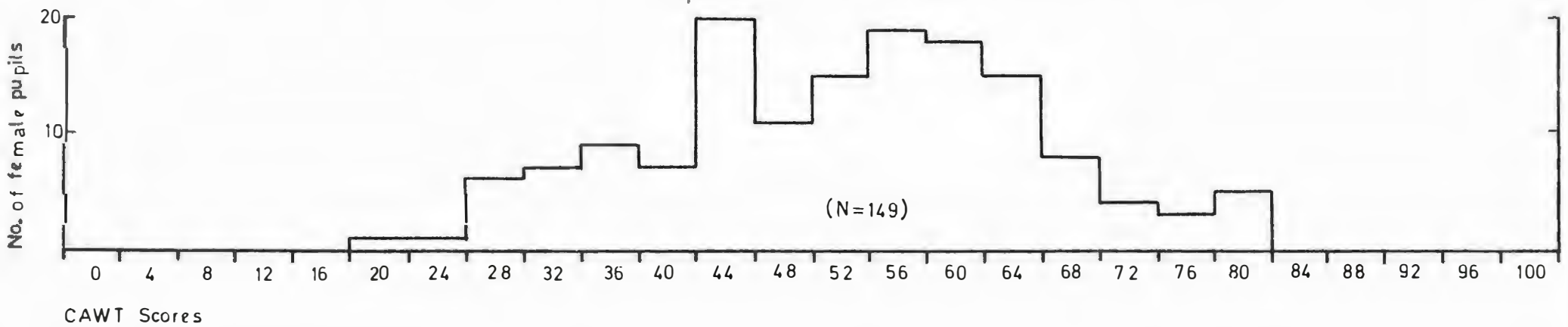
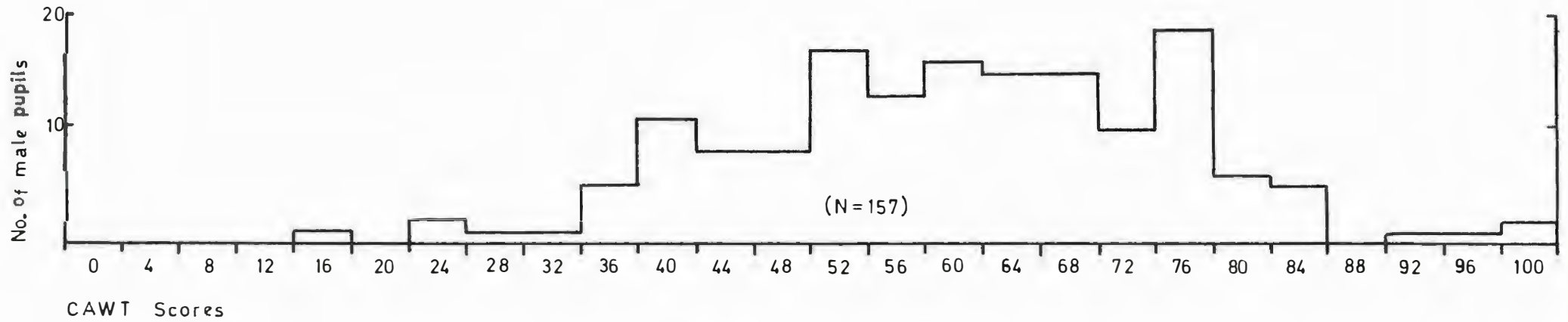


FIGURE 5.3 HISTOGRAMS COMPARING THE DISTRIBUTION OF CAWT SCORES FOR MALE AND FEMALE SUB-GROUPS

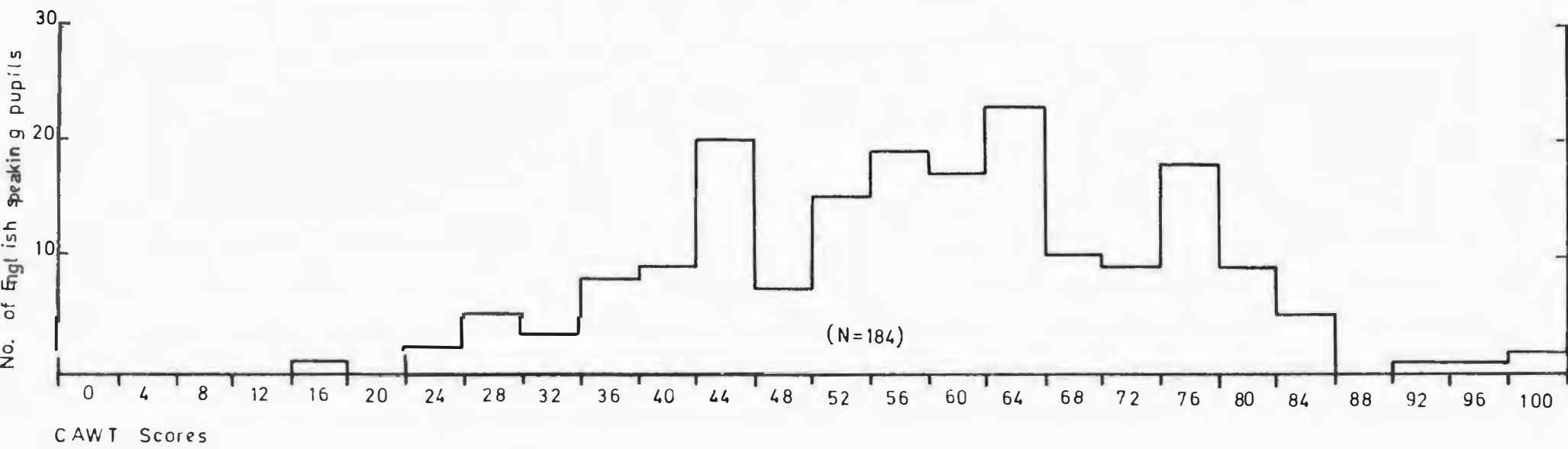
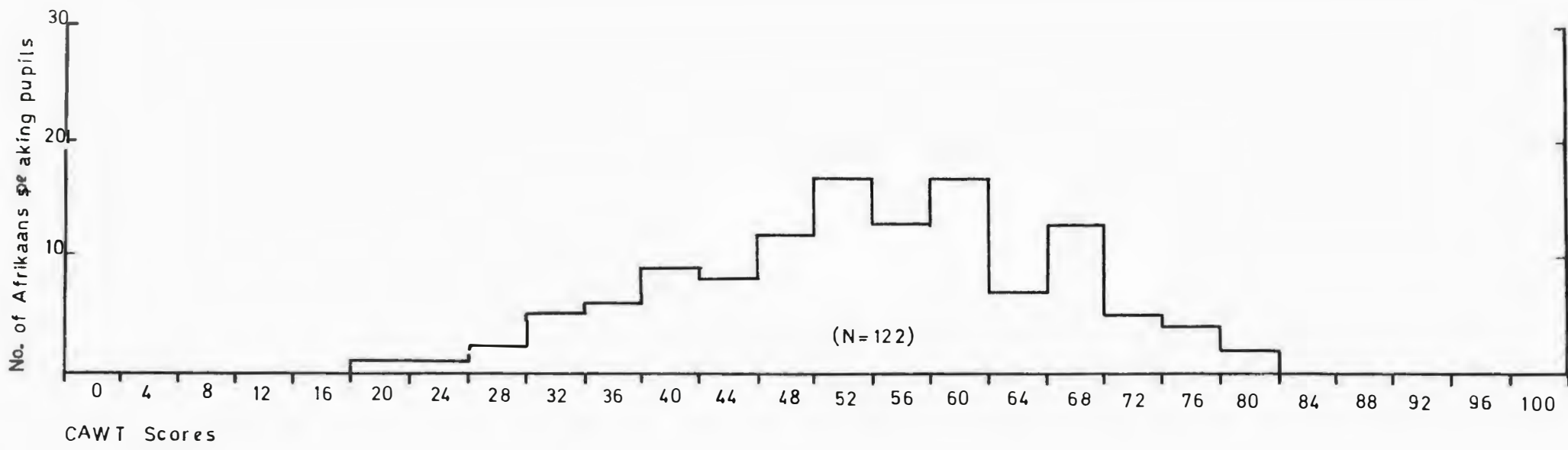


FIGURE 5.4 HISTOGRAMS COMPARING THE DISTRIBUTION OF CAWT SCORES FOR AFRIKAANS AND ENGLISH SPEAKING SUB-GROUPS

- of confidence that the differences occurred by chance.
- b. The male/female breakdown, the  $H_0$  must be firmly rejected at close to 100% confidence that the differences were not caused by chance factors.
  - c. The Afrikaans/English breakdown, the  $H_0$  must be rejected with 99,6% confidence that differences did not occur by chance.

The implications of these results are twofold; for the sample as a whole, two of the three hypotheses postulated in section 1.4b of Chapter 1 must be rejected as untrue, and reasons must be sought to account for the differences. Two probable reasons come to the fore:

- a. Agricultural pupils, whose scores were abnormally high, were all English and male, thus in effect causing the inflation of the scores of these two sub-groupings, while at the same time deflating the average score of the Afrikaans and female sub-groups against whom they were juxtaposed. In effect the scores of males and English speaking pupils were boosted by 0,66% and 0,77% respectively.
- b. The influence of the private schools in the sample had the effect of substantially inflating the scores of the English speaking males but by a smaller margin depressing the scores of the English speaking females. As there were no Afrikaans private schools they were not affected. Table 5.20, which should be read in conjunction with Table 5.17, shows what the sample would look like without private school influence.

If scores are re-calculated to exclude private schools and pupils studying agriculture, the means of males and English speaking pupils would drop to 53,24% and 56,28% respectively, thus substantially reducing the size of the differences.

Testing the significance of the difference between the two new sets of means throws a different light on the picture.

- a. For the male/female combination  $t = 2,306$  which makes the decision to retain or reject the  $H_0$  a dubious one as there are still 2,1 chances in 100 that the difference is due to chance. The possibility must also be allowed that the remaining differences are in fact due to real differences in levels of awareness; females in these circumstances showing a higher level.

TABLE 5.20 RESULTS OF THE CAWT BY STANDARD AND SELECTED GROUPING FOR PROVINCIAL SCHOOLS ONLY

	TOTAL	U	R	♂	♀	A	E	m	f	M	F
AVERAGE % (m)	55,45	54,84	56,40	53,90	56,96	53,70	57,05	57,56	50,93	58,83	54,76
n	255	155	100	126	129	122	133	51	71	75	58
EFFECT OF PRIVATE SCHOOLS*	+0,99%	+1,46%	+0,33%	+6,50%	-4,66%	N/A	+1,23%	N/A	N/A	+2,94%	-1,22%

\* + = inflating influence on score.  
 ~ = deflating influence on score.

N = 255

- b. For the Afrikaans/English combination  $t = 1,634$ , thus allowing retention of  $H_0$  and suggesting that any differences are due to chance.

It might therefore be argued that the sample, as constituted, is not a fair reflection of the target group, which is overwhelmingly in provincial non-agricultural schools, and that if it were composed of a representative proportion of all the cultural sub-groups within the target group, the  $H_0$  as postulated in Chapter 1 might be retained throughout.

When the sample group is subdivided into either four (selected groupings) or eight (basic groupings) sub-groups rather than the dual system used for the standard grouping, the combinations show no significant differences between their means. Following Lewis (1967, p.134ff) an analysis of variance was carried out by comparing the total sum of squares ( $\hat{\sigma}_t^2$ ), the within-group sum of squares ( $\hat{\sigma}_w^2$ ) and the between-group sum of squares ( $\hat{\sigma}_b^2$ ). The results of the comparisons are shown in Table 5.21. Once again in each case the  $H_0$  was that differences between sub-groups were due to chance, and as  $\hat{\sigma}_b^2$  was in every case less than  $\hat{\sigma}_w^2$  the  $H_0$  was retained. Thus, despite apparent differences between the means of the sub-groups, these are in all cases due to chance factors.

Finally, the scores of pupils who have either lived abroad or one of whose parents was a farmer, are of note; the former for its slightly below-average result and the latter for its well above-average result. In terms of conservation awareness it would thus appear that having lived abroad is of little consequence, while, as might be expected, having lived on a farm is a major advantage.

#### 5.4 Test reliability

In accordance with the statements on test reliability made in Chapter 4, the split-half coefficient of reliability ( $r_{\frac{1}{2}\frac{1}{2}}$ ) was applied to the results of the CAWT. Results were split into equivalent halves on the basis of odd and even numbers, thus ensuring that each school and sex or language group within the school were fairly represented in each half.

As  $r_{\frac{1}{2}\frac{1}{2}} = \frac{2r_{xy}}{1+r_{xy}}$ , it was first necessary to obtain the correlation

coefficient 'r' and for this the Product Moment coefficient of correlation was considered the most suitable.  $\sum x$ ,  $\sum y$ ,  $\sum x^2$ ,  $\sum y^2$  and  $\sum xy$  were calculated (x and y each representing one half of the 'split') whereafter the corrected sum of the products ( $\sum' xy$ ) was obtained by using the correction term

$$\sum' xy = \sum xy - \frac{\sum x \cdot \sum y}{n}$$

In an analogous manner the corrected sum of squares was obtained by  $\sum' x^2 = \sum x^2 - \frac{(\sum x)^2}{n}$  and similarly for  $\sum' y^2$ . The coefficient of correlation could then be calculated as follows:

$$r_{xy} = \frac{\sum' xy}{\sqrt{\sum' x^2 \cdot \sum' y^2}}$$

$$= 0,9870$$

$$\therefore \text{ as } r_{\frac{1}{2}\frac{1}{2}} = \frac{2r_{xy}}{1 + r_{xy}}$$

$$= 0,9934$$

(Lewis, 1967, p.189).

indicating very high internal reliability.

### 5.5 The teacher's test

As implied earlier, the idea of administering the CAWT to teachers was an afterthought, partly as a result of post-test discussions with pupils. 25 teachers, spread over eight schools and most standard nine subjects, participated in the survey. All were unknown volunteers approached personally by the researcher whenever the opportunity arose. Their standard groupings were U = 23, R = 2,  $\sigma^1 = 16$ ,  $\phi = 9$ , A = 6 and E = 19 so that they cannot be regarded as representative of teachers in Natal, or anywhere else for that matter. It is furthermore stressed at the outset that the results obtained purport to be no more than an indication of a possible trend and undue emphasis should not be placed upon them.

The average score achieved by teachers on the CAWT was 27,36% with a standard deviation of 17,37. A visual picture of individual scores is given in Figure 5.5, while Table 5.22 lists the scores obtained on individual questions. Clearly this group of teachers have not performed as well on the test as did the sample group of pupils and it is suggested

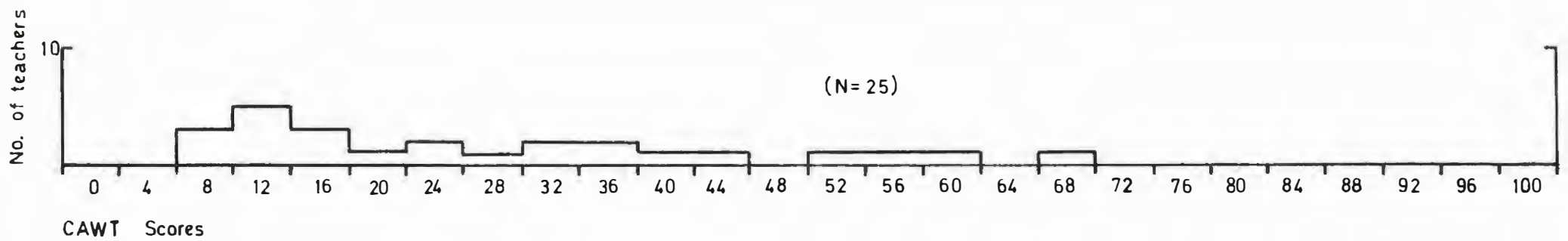


FIGURE 5.5 HISTOGRAM SHOWING DISTRIBUTION OF CAWT SCORES FOR TEACHERS



that validation or rejection of this very tentative comparison might be a worthwhile area of investigation.

TABLE 5.22 TEACHERS' SCORES ON INDIVIDUAL QUESTIONS

QUESTION			NUMBER OF RESPONSES FOR WHICH A POINT COULD BE ALLOCATED
B	1	a	11
		b	6
	2	a	5
		b	12
	3	a	6
		b	3
	4	a	13
		b	3
	5	a	12
		b	2
		c	5
	6	a	7
		b	2
	7	a	7
		b	2
	8	a	9
		b	3
	9	a	11
		b	2
	10	a	7
		b	1
	11	a	16
		b	11
	12	a	11
b		4	

### 5.6 Preliminary conclusions

It is contended that all in all the CAWT proved to be a reasonable test of the general level of conservation awareness among the sample group and, within statistical limitations, is probably a broad reflection of the target group's position. Clear shortcomings in the test, as it stands, have however emerged. Two of the most obvious of these are that it is too short and that the spectrum of concepts tested was too narrow. The

range of concepts should be widened considerably, to include for example, questions relating to plant succession and the gene pool. There are indications, particularly from the open-ended questions, that pupils are more aware of animal-based than plant-based issues and any future test might, in its coverage, attempt to unravel and verify this, as well as to point more specifically to areas of differential awareness, such as birds compared to mammals. Urban pupils in particular seemed to be less aware of the importance of vegetation as the base of the food pyramid. Overall birds did not fare well.

The oral administration of the test appears to have had the desired effect insofar as no alterations were attempted (in contrast to the non-orally administered parts of the questionnaire), a high proportion of contradictory responses occurred and many pupils commented after the test on "being tricked into the truth". In all the answers, the relationship of true beliefs to genuine self-deception and stated beliefs to actual practice remains unknown and indeed an open debate. It will be recalled however that one of the basic assumptions of the study was that the element of genuine honesty involved would have an overriding influence.

Detailed conclusions arising from the CAWT are pursued further in Chapters 6 and 7, where the results are compared with the factors which might have an influence upon them. An evaluation of the test is included in Chapter 9.

## CHAPTER 6 PUPILS' CONSERVATION BACKGROUND

This chapter is a detailed analysis of Section A of the questionnaire, insofar as the results of the questions are relevant to the particular interests of this study. As the results do in fact have a relevance and reference far wider than our immediate concerns, constant constraint has had to be exercised in the selection and presentation of material. Likewise the amount of statistical treatment which could be carried out is almost limitless, but preference has been given to presenting an overall picture and to pointing out trends and possible lines of further investigation.

The purpose of Section A was two-fold:

- a. To ascertain what conservation-orientated experiences members of the sample group might have had and to compare aspects of these with the results of the Conservation Awareness Test (CAWT).
- b. To develop, on a tentative basis, a scored Index of Background Experience (termed the IBE), both for the purpose of testing it as a method and for comparison with the overall results of the CAWT.

Each question was thus to have an intrinsic value and stand on its own in relation to the CAWT, while in addition, all but three were designed to be scored as component parts of the IBE.

### 6.1 Development and construction

Fundamental to the development of Section A, particularly for the purposes of obtaining an IBE, was the fact that there were no known indices, 'normal' distributions or experimental precedents upon which to base expectations. This situation was most pertinent in terms of determining:

- a. What, and how many, conservation-orientated experiences might reasonably be expected of a member of the sample group.
- b. The value of these experiences in relation to each other.

The choice and construction of questions, as well as the allocation of 'points' both within and between questions, was to a high degree arbitrary and experimental. Several assumptions were made, based either upon generally accepted educational principles, or on the researcher's personal

experience in the field. As this arbitrariness was applied across the board it is, within its own limitations, provisionally acceptable, provided that questions and their results are not compared on the basis of point allocation. Furthermore, any references to the target group would have to assume similar patterns of scoring.

Section A was constructed in line with the objectives stated in Chapter 1 and the principles outlined in Chapter 4, a basic assumption being that all the questions selected had a potential influence on the level of conservation awareness. The procedure followed was to attempt to isolate the areas and experiences in pupils' backgrounds which might have influenced their level of conservation awareness. The method of doing this was a combination of judgement based on personal experience and consultation with other individuals with knowledge of, and experience in the development of environmental awareness. The broad areas of influence decided upon and the related questions framed around them are shown in Table 6.1. As was the case with the CAWT, there was some conceptual overlap. Quite clearly the first three areas of influence are intrinsic to the entire survey and, by virtue of the pupil coding system described in Chapter 4, embodied in the analysis throughout. Questions arising from and relating to the other five areas of influence form the basis of the present chapter.

Two minor anomalies in the survey, the status and positioning of questions A15 and C13 (see Appendix B) are best covered at this point. The information embodied in question A15 was wanted as an indication of breadth of vision, but the question presented a number of difficulties as to where to include it. Although an item of knowledge, it does not comply with criteria for inclusion in the CAWT, which relates to universal principles. It could also not be included in Sections C or D as it did not relate to the matters covered there, so that it was finally included in Section A for administrative, but not IBE scoring, purposes. It was not scored as its cognitive component barred it from inclusion, although in part both the question and responses related to background in the sense of living in Natal. Other than for the fact that Section B was verbally administered, question A15 might, in retrospect, as easily have been included there. It would however

TABLE 6.1 THE GENERAL RELATIONSHIP BETWEEN AREAS OF INFLUENCE AND QUESTIONS IN SECTION A

AREA OF INFLUENCE	RELATED QUESTION			
Sex (male/female)	1			
Cultural group (Afrikaans/English)	covered by language of questionnaire			
Physical environment (urban/rural)	covered by school, 4 and 5			
The role of parents	2	10		
The role of school and teachers	3	7	10	11
Active (first hand) participation in conservation experiences	6	7	13	
Visits to conserved areas	7	8	10	
Frequency of exposure to conservation experiences	7	8	9	
The role of the media (books, magazines, television)	12	14		


have proved administratively awkward.

Question C13, concerning access to television and pupil assessment of its value in conservation awareness terms, was originally included in Section C as it was considered to be primarily concerned with the pupils' perception of the value of television. Perspectives gained from the research have however brought about a revision of this view and the question is now seen more as a background factor, best suited for discussion in this chapter. It has not however been included in the scoring schedule for the IBE, as it still has a strong perception component, particularly in the second part. It might be argued that the question could have been split to allow inclusion of the first part only in the IBE, but whether this could be justified is debatable; the question as a whole is in too general a form, without reference to type or quantity of programmes viewed.

Referring to the composition of the IBE, all questions in Section A, apart from A1, A10 and A15, were included to give a total score of 50. Questions A1 and A10 were excluded from the scoring as on present knowledge, no differential values could be attributed to the alternatives. Point allocations to individual questions and relationships between the questions are dealt with in section 6.2 below, while all relevant administrative aspects have been covered in Chapter 4. A most important point concerning scoring, is to stress that at no stage was it considered likely that any individual pupil would have had all, or even a majority of the experiences listed in the IBE. The exercise was to establish an index and was not in itself a test with connotations of good and poor performance. Performance did not enter the issue and results should not at any stage be construed in this way.

## 6.2 Individual question analysis

This section examines individual questions in terms of their rationale, contributory value to the IBE, intrinsic value and relationship to the results of the Conservation Awareness Test. Question A1 is not applicable.

6.2.1 Question A2: FATHER'S OCCUPATION  
MOTHER'S OCCUPATION 

Accompanying verbal instructions (AVI):

"Write in your father's present occupation and your mother's trained occupation, even if she is a housewife at present. If she has no training or occupation write NIL. Now, whatever else you have written, if your mother is presently a housewife, write an H in the red square."

In addition to the general purposes stated in section 6.1 above, the specific purpose of this question was to compare parental occupations with the CAWT scores. For the IBE score, if either parent was recorded as working in a nature conservation organisation or capacity, one point was allocated, thus allowing a maximum of two for the question. In the event, only three pupils scored, one obtaining two points and two obtaining one point each.

Because of the small numbers in individual vocations, parental occupations were grouped into five broad categories, roughly corresponding to those used in the Department of Labour and in census statistics i.e. professional, commercial, worker/artisan, agriculture and 'other'. In the case of fathers the declared occupation was used, while in the case of mothers, the 'trained for' occupation, if given, was used irrespective of whether they were currently employed or not. The criteria for the occupational divisions were as follows:\*

- a. Professional; academics, architects, accountants, clergy, doctors, engineers, lawyers, nurses, personnel officers and teachers.
- b. Commercial; bookkeepers, company directors, credit-controllers, clerks, exchange operators, telephonists, passport officers, receptionists, salesmen/women, typists, shop assistants, shop owners and post office employees. All 'businessmen', 'managers' and administrative officers were included here unless they were clearly stated to be one of the vocations in 'a' above.

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\* While the vocations listed for each division are nowhere near exhaustive, they nevertheless cover the full spectrum appearing in the survey.

- c. Workers/artisans; primarily consisting of those individuals working 'on the bench' or 'with their hands' i.e. all artisans, SAR employees (unless a more specific function was given), technicians, roadworkers, quarrymen, seamstresses and anyone else involved in secondary economic activity.
- d. Agriculture; farmers and one forester were the only vocations represented in this category.
- e. Other; policemen, military personnel, pensioners, 'retired' persons and housewives with no stated occupation or training.

The results of this categorisation are shown numerically for the sample in Table 6.2 and as percentages for the standard groupings in Table 6.3.

TABLE 6.2 PARENTAL OCCUPATIONS BY CATEGORIES FOR SAMPLE GROUP

	TOTAL	PROFESSIONAL	COMMERCIAL	WORKERS/ ARTISANS	AGRICULTURE	OTHER
FATHER	283*	64	84	69	49	17
MOTHER	291*	85**	113	6	1	86†

\* The difference between the totals and the sample size represent those pupils who responded for one parent only.

\*\* Of these 39 were nurses and 32 teachers.

† In addition to this figure, of whom 38 were 'housewives' with no other declared occupation, a further 86 mothers were currently 'housewives', but fell under the professional and commercial categories because of their training.

With reference to Table 6.3 a number of points are of note:

- a. In terms of fathers;
  - i. The fairly even split of professional parents among the opposing sub-groups.
  - ii. The expectedly greater proportion of both commercial and worker/artisan occupations in the urban sub-group and agricultural occupations in the rural sub-group.
  - iii. The predominance of agricultural occupations in the English sub-group, a point which has already been raised in the



TABLE 6.3 PARENTAL OCCUPATIONS BY STANDARD GROUPING EXPRESSED AS A PERCENTAGE OF THE TOTAL SAMPLE

CATEGORY	TOTAL	U	R	♂	♀	A	E
F Professional	20,91	22,84	17,43	21,02	20,81	21,31	20,65
A Commercial	27,45	30,96	21,01	25,48	29,53	26,23	28,26
T Worker/Artisan	22,55	25,38	17,43	23,57	21,48	22,95	22,28
H Agriculture	16,01	7,61	31,19	18,47	13,42	9,84	20,11
E Other	5,56	7,11	2,75	4,46	4,70	9,84	2,72
R Residue*	7,52	6,10	10,19	7,00	10,06	9,83	5,98
M Professional	27,78	25,38	32,11	25,47	30,20	21,31	32,06
O Commercial	36,93	37,06	36,70	36,94	36,91	34,43	38,59
T Worker/Artisan	1,96	2,54	0,92	1,91	2,01	0,82	2,71
H Agriculture	0,33	0,00	0,92	0,00	0,67	0,82	0,00
E Other	28,10	27,41	25,68	32,48	23,49	34,34	23,91
R Residue*	4,90	7,61	3,67	3,20	6,72	8,28	2,73

\* represents either no parent or no occupation recorded.

discussion of CAWT scores and to which we will return later.

b. In terms of mothers;

1. The less even professional split between the various subgroups and the more even commercial split.
- ii. The miniscule proportions of agriculturists and worker/artisans and the high proportion of 'others'.

The extent to which these factors may or may not have influenced conservation awareness of pupils in the sample cannot be determined with accuracy from the data available, but when comparing the five occupational divisions of parents with the CAWT scores, as shown in Table 6.4, an interesting pattern emerges.

Assuming the influence of mothers and fathers over their children to be equal for our purposes, the most valid comparison lies between the 'both parents professional' and the 'both parents commercial' groups, as the 'one parent' categories all have elements of each within them. The 'both parents worker/artisans' category is interesting, but too small for consideration, while the agricultural factor has already been examined in Chapter 5. Using estimates, based on earlier calculations of the same size sample, the difference between the means of the 'both parents professional' and 'both parents commercial' categories is almost certainly

significant and due to more than chance factors. The result would not be out of context with widely held sociological views.

TABLE 6.4      RELATIONSHIP OF PARENTAL OCCUPATION TO CAWT SCORES

CATEGORIES AND COMBINATIONS		NO. OF PUPILS INVOLVED	AVERAGE CAWT SCORE*
One parent:	professional	98	57,35
	commercial	124	57,74
	worker/artisan	71	52,45
Both parents:	professional	24	58,33
	commercial	38	50,01
	worker/artisan	2	58,00
One parent in agriculture		49	63,84

\* Average CAWT score for whole sample = 56,46

6.2.2 Question A3: Which of the following subjects are you studying at present?

Geography	<input type="checkbox"/>
Biology	<input type="checkbox"/>
Agriculture	<input type="checkbox"/>

An examination of the syllabi of the three environmentally orientated subjects (geography, biology and agriculture) taught in the third and fourth phases in Natal schools, shows a clear potential for the development of conservation awareness. However, the extent to which the syllabi are generally exploited to this effect is, in the opinion of the writer, an open question, a point also made by Hurry (1978). On the other hand, it is held that some conservation rub-off is possible, irrespective of how the subjects are taught, and that in most cases there probably is some degree of positive influence, some evidence for this contention having been led in Chapter 5. It is also pertinent to bear in mind that the development of conservation awareness is not the sole prerogative of these subjects. All subjects, depending upon how they are taught, have the potential. The writer is personally aware of individuals with an acute sense of environmental and conservation awareness, stemming entirely from

subjects such as English, history and art.

Viewed on a broader scale, the general relationship of these subjects to both environmental education and conservation awareness has been covered elsewhere (IUCN, 1968a, 1968b; Nicholson, 1972; Bale *et al.*, 1973; Carson, 1973; Council of Europe, 1975, 1976a; Pritchard, 1975; Wheeler, 1975; Marsden, 1976; Shortle, 1976; Wheeler & Waites, 1976; Hurry, 1978). It is not the intention to repeat the arguments here nor to enter the realm of curriculum development, but it is important to note that there is widespread agreement on the potential which exists within these subjects for creating and promoting environmental and conservation awareness. By contrast there is worldwide disparity of opinion on their effectiveness or achieved value in these terms. This led to the decision to allocate one point for each subject being studied, giving a maximum of three.

The responses to the question and the relationship of subjects and combinations to the CAWT score are given in Table 6.5. Although the results may appear to indicate a clear trend, particular care must be taken not to confuse cause and effect on this question. While it might be true that pupils in certain subject groupings score consistently higher on the CAWT than those not studying these subjects, the relationship between conservation awareness and subject is not clear-cut. All agricultural pupils were, for example, the children of farmers, and although the average CAWT score of farmer's children not studying agriculture was, at 58.93%, still above average, the probability must be allowed, that some pupils chose agriculture and indeed the other subjects, because they were more conservationally aware and did not necessarily perform well only because they studied these subjects.

Having made this point, and noting the average CAWT scores of pupils studying none of the three subjects, one is nevertheless on fairly safe ground in concluding that there is probably a clear relationship between levels of conservation awareness and the inclusion of environmentally orientated subjects in the school curriculum. There is however very much less certainty of the specific influences of the three subjects in relation to each other. A far more detailed survey would be required before any definite conclusions could be reached.

TABLE 6.5    RESPON ESTO QUESTION A3 IN RELATION TO CAWT SCORES

SUBJECTS AND COMBINATIONS	NO. OF PUPILS INVOLVED	AVERAGE CAWT SCORE (%)
Geography only	66	58,79
Biology only	51	54,27
Geography and biology	120	57,57
Agriculture, geography & biology*	17	65,80
None of these subjects	52	48,53

\* In all cases pupils studying agriculture were also studying geography and biology.

### 6.2.3 Questions A4 and A5

Question A4: What is your home town at present?

AVI: "If you're a boarder, write down your home town. If you live on a farm, write down 'farm' with the nearest town in brackets."

Question A5: Where else have you lived in the past ten years?

AVI: "If this is different from your present home town, give the place name e.g. 'Rhodesia', 'on a farm' or 'Pretoria'. If you can remember put the year(s) you lived at each place behind it in brackets."

The general assumption underlying these two questions was that present and past places of residence and abode have an influence on conservation awareness. More specifically, it was assumed that a rural background, particularly one entailing farm residence, was an advantageous factor. With the perspective derived from the survey, particularly in the light of the equivocal CAWT performance of urban and rural sub-groups, the specific assumption is however open to some question. Had the basis of urban/rural delineation been more strictly along the traditional lines of farm or village opposed to town or city, the result would probably have been different, as is strongly suggested by the performance of farmer's children. Thus, while there is no reason to doubt the validity of the general assumption, the performance of farmer's children in fact

lending it a degree of credibility, the assumption based on the division of urban and rural as defined is of dubious validity.

The results of both these questions were embodied in the pupil coding with the intentions explained in Chapter 4 and were also used for the IBE score, although in view of the points made above, this is now shown to be of less validity than had initially been assumed. This could not however be foreseen at the time. In the case of question A4, one point was allocated for a pupil whose home town was a 'country' town, irrespective of whether they were at an urban or rural school. An additional point was allocated if the pupil lived on a farm as distinct from being a farmer's child at boarding school, thus allowing a maximum of two. For question A5, one point was allocated to a pupil with a 'predominantly rural' background.

6.2.4 Question A6: Do you belong to any of the following organisations?

Boy Scouts/Girl Guides

Voortrekkers

A wildlife society

A bird club



AVI: "Complete the white column if you are at present a member. If you were, but no longer are, tick the red column. Write in any other such organisations which you have belonged to in the past or belong to now, underneath the question."

In terms of the criteria enunciated in section 6.1 above, the general purpose of questions A6, A7 and A8 is self-evident. The intrinsic value of this particular question lies in the information which it provides on the relationship to, and attitudes of the sample group towards environmentally orientated organisations to which they would have fairly easy access and which would in general welcome their participation. No other organisations were listed.

For IBE scoring, Boy Scouts/Girl Guides and Voortrekkers were considered mutually exclusive, as were a wildlife society and a bird club. It was considered unreasonable to expect a pupil to belong to duplicate

organisations, a foresight vindicated by the results. Two points were allocated for current membership and one for past membership, thus allowing a maximum of four.

The responses to the question, by standard grouping, and the relationship of the sub-totals to the corresponding CAWT scores, are given in Table 6.6. Although numbers are in most cases too small for conclusive deductions, three areas of interest emerge.

- a. The very small proportion of the sample group currently belonging to any of these organisations, particularly when, as in the case of Scouts or Voortrekkers, viewed in relation to past membership. Membership of wildlife societies and bird clubs was never high, but the drop-off rate is proportionately far less, so that by the time the average age of the sample group is reached, they are more attractive than either Scouts or Voortrekkers. The reasons for the very high drop-off rates among these youth movements are not our present concern, and in fact have been the cause of much soul-searching and deliberation among the organisations themselves. The relatively greater attraction of wildlife/bird clubs is also no reason for complacency, as numbers are still small, and at least part of their attractiveness may lie in their more passive and less demanding requirements.
- b. The general levels of concurrence between the various sub-groupings. The only real discrepancies are the greater urban support for current membership of organisations and the slight differences in past and present Afrikaans/English patterns, the former giving stronger support to the Scout/Voortrekker movement and the latter to wildlife and bird clubs.
- c. The relationship of the CAWT scores of those pupils who have 'belonged' at some stage compared with those who have never belonged. There is a clear distinction here with calculations indicating the rejection of the  $H_0$  at the 99% level of confidence. The highest CAWT scores also appear to be associated with wildlife society and bird clubs rather than Scouts and Voortrekkers, although the latter clearly play a role. As with question A3 however, particular care must be taken in this question not to confuse cause and effect.

TABLE 6.6 RESPONSES TO QUESTION A6 BY STANDARD GROUPING EXPRESSED BOTH NUMERICALLY AND AS A PERCENTAGE OF THE TOTAL SAMPLE

	TOTAL		U		R		♂		♀		A		E		CAWT SCORES
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
Currently Scout/Guide/Voortrekker	9	2,94	8	4,06	1	0,92	5	3,18	4	2,68	6	4,92	3	1,63	59,56
Past Scout/Guide/Voortrekker	101	33,01	65	32,99	36	33,03	53	33,76	48	32,21	42	34,43	59	32,07	56,95
Current WLS/Bird club member	19	6,21	14	7,11	5	4,59	14	8,92	5	3,36	6	4,92	13	7,07	64,21
Past WLS/Bird club member	30	9,80	18	9,14	12	11,01	14	8,92	16	10,74	7	5,74	23	12,50	63,47
Current member of both groups*	1	0,33	1	0,51	0	0,00	1	0,64	0	0,00	1	0,82	0	0,00	68,00
Past member of both groups*	6	1,96	3	1,52	3	2,75	5	3,18	1	0,67	1	0,82	5	2,72	57,33
Never belonged to any of these	147	48,04	92	46,70	55	50,46	71	45,22	76	51,01	61	50,00	86	46,74	49,63
n	306		197		109		157		149		122		184		

\* These two categories overlap with other current and past figures above.

N = 306

For conservationists and those concerned with the development of environmental awareness, the lesson is quite clear. There is a substantial gap waiting to be filled, which almost certainly also applies to age groups other than those which the sample represents. Innovative methods for attracting 'teenagers' must be sought and developed so that conservation activities are meaningful and interesting to them. Review of the current national situation in this regard shows little promise, the only real potential lying in the 'Wildlife Clubs' scheme referred to in Chapter 3. Its long term effectiveness will depend largely on whether the scheme takes cognisance of the modern teenager's interests and value systems, and whether the situation of 'yet another transient club' with occasional outings and a magazine produced largely by adults, is avoided.

6.2.5 Question A7: Have you ever been on a:

Land Service Camp	<input type="checkbox"/>	<input type="checkbox"/>
Veld and Vlei course	<input type="checkbox"/>	<input type="checkbox"/>
Wilderness Leadership School course	<input type="checkbox"/>	<input type="checkbox"/>
Parks Board Wilderness Trail	<input type="checkbox"/>	<input type="checkbox"/>
Joint Venture course at Umgeni Valley	<input type="checkbox"/>	<input type="checkbox"/>
Cedara School Camps	<input type="checkbox"/>	<input type="checkbox"/>

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

AVI: "If you can remember what year or years you went, write it in the two red columns. If you have been on a similar type of course not listed write it underneath the question."

The listed courses were, at the time of the survey, the only discrete courses of their kind in Natal in which members of the target group could participate. No pupils availed themselves of the opportunity to list any other. While there were known differences in course content, the assumption was that they were equal in conservation education terms, until evidence to the contrary was found. The purpose of asking the date of course attendance was to have a time-lapse comparison for CAWT scores. This did not work as very few pupils could remember the dates or exact years when they had been on these courses. Had there been more time available these could have been worked out jointly by the researcher and the pupils, but this was not the case. The results of the CAWT are therefore compared simply with the raw indication of past attendance at



one or more of the courses. Attention is also drawn here to the locational factors, referred to in section 4.3, which may have influenced attendance at particular courses.

The value of active conservation on the part of individuals and of field-work in natural surroundings has been dealt with elsewhere (e.g Lambert, 1967; USDA, 1971a, 1971b; NEA, 1972; Newbould, 1974; Parker, 1974; Arnold, 1976, 1978; Herbert, 1976) and it is the writer's firm conviction from personal experience, that it can be, and often is, the major contributor to an individual's level of conservation awareness. Thus two points were allocated for any course attended — to a maximum of 12, as such a possibility was considered feasible, even if unlikely. The highest score obtained was eight.

The responses to the question are shown by standard grouping in Table 6.7, the following salient points emerging:

- a. A majority (61,11%) of the sample group have attended at least one of the courses, 70 pupils (22,88%) have attended two or more. Reliable comparative figures for other countries are not available, but the estimated figure for the UK, USA and Japan is 20% - 40%, for the Netherlands 60% - 70% and for the USSR it is said to be 95%\*. The sample group would thus appear to be comparatively well off in this respect, but in passing, one cannot help speculating on what the comparable figure for other racial and social groups in South Africa might be. One wonders whether, for some groups, it is even as much as 1%.
- b. There are substantial variations in the patterns of urban, rural, English and Afrikaans speaking pupils attending courses. If these four sub-groupings are re-arranged into selected groupings, the indication is that the UE sub-group (70,83%) are most likely to attend such courses, followed by the UA (61,04%), RE (56,25%) and RA (42,22%) pupils. Afrikaans and English speaking pupils also tend to participate in different types of courses, the former predominating in those run by the province and the Depart-

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\* The figures are an aggregate based on information obtained by the writer, from several sources, whilst visiting the United Kingdom and Europe during 1978.

TABLE 6.7 RESPONSES TO QUESTION A7 BY STANDARD GROUPING EXPRESSED NUMERICALLY AND AS PERCENTAGE OF n

CATEGORIES AND COMBINATIONS	TOTAL	F	R	D <sup>1</sup>	Q	A	E
Land Service Camps (LSC) only	14 (4.38)	7 (3.36)	7 (6.42)	6 (3.82)	8 (5.37)	10 (8.20)	4 (2.17)
World and Viet (VY) only	8 (2.61)	6 (3.05)	2 (1.83)	6 (3.82)	4 (2.67)	7 (5.72)	6 (3.26)
Kilbourn Leadership School (KLSL) only	4 (1.31)	1 (0.51)	3 (2.75)	2 (1.27)	4 (2.67)	1 (0.82)	3 (1.63)
Yard Parks, Boardwalkerness Field (NPR) only	11 (3.59)	7 (3.56)	4 (3.67)	3 (1.91)	8 (5.37)	1 (0.82)	7 (3.80)
Front Venture (FV) only	49 (16.01)	36 (18.27)	13 (11.93)	20 (12.74)	29 (19.66)	0 (0.00)	49 (26.63)
Leaders School Camps (CSC) only	31 (10.13)	26 (13.20)	5 (4.59)	17 (10.83)	14 (9.40)	20 (16.39)	11 (5.98)
I and LSC	1 (0.33)	1 (0.51)	0 (0.00)	1 (0.64)	0 (0.00)	0 (0.00)	1 (0.54)
I and NPR	2 (0.65)	1 (0.51)	1 (0.92)	1 (0.64)	1 (0.67)	0 (0.00)	2 (1.09)
I and KLSL	5 (1.63)	4 (2.03)	1 (0.92)	3 (1.91)	2 (1.34)	0 (0.00)	5 (2.72)
I and VY	1 (0.33)	0 (0.00)	1 (0.92)	1 (0.64)	0 (0.00)	0 (0.00)	1 (0.54)
I and CSC	16 (5.23)	16 (8.12)	0 (0.00)	10 (6.37)	6 (4.03)	0 (0.00)	16 (8.70)
I and NPR	4 (1.31)	3 (1.52)	1 (0.92)	1 (0.64)	3 (2.01)	2 (1.64)	2 (1.09)
I and LSC	22 (7.19)	13 (6.60)	9 (8.26)	11 (7.01)	11 (7.38)	19 (15.57)	3 (1.63)
I and VY	6 (1.96)	5 (2.54)	1 (0.92)	3 (1.91)	3 (2.01)	1 (0.82)	1 (0.54)
I and NPR	4 (0.33)	0 (0.00)	1 (0.92)	0 (0.00)	1 (0.67)	1 (0.82)	0 (0.00)
I, VY and CSC	1 (0.33)	1 (0.51)	0 (0.00)	1 (0.64)	0 (0.00)	1 (0.82)	0 (0.00)
I, KLSL and IV	1 (0.33)	0 (0.00)	1 (0.92)	1 (0.64)	0 (0.00)	0 (0.00)	1 (0.54)
I, NPR and IV	1 (0.33)	0 (0.00)	1 (0.92)	1 (0.64)	0 (0.00)	0 (0.00)	1 (0.54)
I, KLSL, NPR and IV	1 (0.33)	1 (0.51)	0 (0.00)	1 (0.64)	0 (0.00)	0 (0.00)	1 (0.54)
I, KLSL, CSC and IV	1 (0.33)	0 (0.00)	1 (0.92)	1 (0.64)	0 (0.00)	0 (0.00)	1 (0.54)
I, NPR, CSC and IV	3 (0.98)	3 (1.52)	0 (0.00)	2 (1.27)	1 (0.67)	0 (0.00)	3 (1.63)
I, VY, NPR and CSC	1 (0.33)	0 (0.00)	1 (0.92)	0 (0.00)	1 (0.67)	1 (0.82)	0 (0.00)
I, KLSL, VY and CSC	1 (0.33)	0 (0.00)	1 (0.92)	1 (0.64)	0 (0.00)	0 (0.00)	1 (0.54)
I, KLSL, VY, NPR and IV	1 (0.33)	0 (0.00)	1 (0.92)	1 (0.64)	0 (0.00)	0 (0.00)	1 (0.54)
I, KLSL, VY, NPR and IV	1 (0.33)	1 (0.51)	0 (0.00)	1 (0.64)	0 (0.00)	0 (0.00)	1 (0.54)
I, KLSL, NPR, IV and CSC	1 (0.33)	0 (0.00)	1 (0.92)	1 (0.64)	0 (0.00)	0 (0.00)	1 (0.54)
TOTAL ATTENDING	187 (61.11)	132 (67.00)	55 (50.46)	95 (60.50)	92 (61.74)	66 (54.09)	121 (65.76)
NO. OF PUPILS NOT ATTENDING ANY COURSE	119 (38.89)	65 (33.00)	54 (49.54)	62 (39.50)	37 (38.26)	54 (45.91)	63 (34.24)
	306	197	109	157	149	122	184

ment of National Education, and the latter in courses run by private organisations. Although the reasons for this are not strictly our concern, a clue to the answers can be found in the politico-cultural issues broached in Chapter 2. There are also reasons of more local significance, such as instruction at 'Joint Venture' courses, up to the time of the survey, being offered in English only. Referring to urban predominance on courses, one can only assume that urban pupils and schools feel a greater need for this type of experience than do their rural counterparts, who often literally have such facilities on their doorsteps.

- c. While overall comparison of males and females show minimal differences, when sex is combined with language, the picture which emerges is that English females (66,67%) are most likely to attend the listed courses, followed by English males (65,07%), Afrikaans females (56,34%) and Afrikaans males (50,98%). Synthesis of these factors thus leads to the conclusion that the pupil most likely to attend is an English urban female and the person least likely to go on one of the courses is an Afrikaans rural male.

Examination of the relationship between the number of different courses attended (not to be confused with frequency of attendance) and the average CAWT scores, as shown in Table 6.8, show a clear positive correlation, so clear in fact, that it would be difficult to ignore as a factor influencing environmental awareness, even allowing for the four course anomaly. Taken in conjunction with the results of question A6 the picture which begins to emerge is the importance of direct involvement and participation as a factor in creating conservation awareness. The value of first-hand experience as opposed to passive, or second-hand, learning is widely recognised, at least in theory if not always in practice, among environmental educationists around the world, and is commonplace in American publications on the subject. As a concept it is most succinctly summed up by S.A. Knapp in the words:

"What a man hears he may doubt,  
 What a man sees he may possibly doubt,  
 What a man does himself, he cannot doubt."  
 (Quoted in USDA, 1970a, p.2).

TABLE 6.8      RELATIONSHIP BETWEEN VARIETY OF COURSES  
ATTENDED AND CAWT SCORES

NO. OF DIFFERENT COURSES ATTENDED	NO. OF PUPILS INVOLVED	AVERAGE OF CAWT SCORES (%)
0	119	54,44
1	117	56,58
2	58	57,79
3	8	67,50
4	4	59,00

The comparative popularity of the courses among the sample group may be judged by looking at both the total number attending each course type and the number who have only attended one of the courses. These figures are given, together with the corresponding CAWT scores, in Table 6.9, which shows that in terms of course attendance, 'Joint Venture' and the Natal Education Department's 'Cedara Camps' have a commanding lead. Table 6.7 shows that pupils who have attended these two courses are also proportionately less likely to attend other courses than if they had attended one of the other four options. The major implication of these figures, which have probably not altered markedly since 1978, is the onus of responsibility put upon the three most popular courses. More than any of the other organisations, they are in a position to lead and influence pupils towards conservation awareness.

Referring to the CAWT scores, the results are ambivalent with the highest scores tending to be obtained by those organisations concentrating on leadership i.e. Veld and Vlei and the Wilderness Leadership School. While these figures are commendable, it is also important to note both the small numbers involved and to recall the selective nature of the groups with which they work, as noted in Chapter 3. The Natal Parks Board trails are not primarily educational in purpose, and in fact vary greatly in their educational component, which would in part account for the lower score achieved. Of the three remaining courses 'Joint Venture' comes out best overall, bearing in mind that its courses are aimed primarily at creating conservation awareness, while the other two have much broader aims and

TABLE 6.9    RELATIONSHIP OF COURSES ATTENDED TO CAWT SCORES

COURSE	TOTAL NUMBER OF PUPILS ATTENDED	AVERAGE CAWT SCORE (%)	NO. OF PUPILS WHO ATTENDED ONLY ONE TYPE OF COURSE	AVERAGE CAWT SCORE (%)
Land Service Camps	42	57,24	14	53,43
Veld and Vlei	18	66,89	8	63,00
Wilderness Leadership School	13	66,76	4	55,00
Natal Parks Board Wilderness Trails	26	50,00	11	49,82
Joint Venture	84	60,76	49	60,82
Cedara School Camps	87	55,26	31	52,13

objectives. Most important of all however is that the results be compared with those for pupils who have not attended any of the courses (see Table 6.8), for herein lies the real measure of their value.

In drawing the threads of the question together, a number of factors are pertinent. A shortcoming in the question is that we are unable, from the information contained therein, to gauge the impact or effect of having attended the same type of course several times. It is known that a substantial, but undetermined, proportion of pupils return to the Umgeni Valley on more advanced, or similar, courses, but the situation for the others is not known. There is also no idea of the long-term effect or value of the courses and it is simply assumed, as with all other education, that 'something will stick', in attitude if nothing else. We may, on the basis of present results, refer to those pupils who have never attended any courses as 'relatively deprived' in environmental awareness terms at this stage of their development. For how many of these pupils the situation will be redressed in later life and, for how many of the course attenders other influences may override or cancel their 'achieved conservation awareness' at 17 years, we do not know. It is perhaps fortunate for the cause of environmental and conservation awareness that most of these problems also exist for education in general.

6.2.6 Question A8: Have you ever been to:

Kruger National Park	
Giant's Castle Game Reserve	
Royal Natal National Park	
Umfolozi or Hluhluwe Game Reserves	
Mkuzi or Ndumu Game Reserves	
Stainbank Nature Reserve	
Queen Elizabeth Park	
Natal Lion Park	
A Botanical Garden	
Name any other Game Reserves, Nature Reserves or wild places you have visited.	

The underlying assumption of the question is that there is some relationship, as yet not clearly determined, between visits to conserved areas

such as those listed and general conservation awareness. Certainly much of what conserved areas have to offer is abstract, hard to define and impossible to measure, but there is little dispute as to the fact that there is 'something'. One of the most prosaic and embracing descriptions is to be found in the resource centre of the Peak District National Park in England:

"Peace is often mentioned; beauty; spiritual refreshment; escape, novelty, the delight of something different; the answers to questions we have not yet learned to ask, a connection to the origin of things, an opening into the future, a source of sanity for the present."

All these things are undoubtedly part of what conservation awareness is about.

The majority of all visits to conserved areas are essentially passive undertakings, insofar as the visitor's activity is most often confined to observing or obeying. If recording of any sort is done, it is usually at a distance and confined in context. Important areas of exception do exist, as for example, where walking is permitted or encouraged, such as in the Natal Drakensberg, but here too, for most individuals this is passive in that they are simply benefitting from conservation, seldom participating or having the opportunity to participate in its continuance. Even in those areas where good interpretive services exist, a rarity in South Africa, the visitor is simply the receiver of pre-selected information, rather than the investigator, discoverer and recorder.

It is in this context that the inclusion of a botanical garden as a conserved area should be seen. While it is not comparable with the complexity and diversity of a natural ecosystem, such as could be seen at Ndumu Game Reserve, or Kruger National Park, it is a facility far more easily available to the majority of people and furthermore, one in which individuals have far greater choice of the level and intensity at which they choose to experience conservation. In addition to what is physically offered by any particular area, the value of a visit, in conservation awareness terms, depends largely upon the extent to which sensitivity can be developed. This in turn depends in part upon the degree to which all the senses, including those of touch, taste and smell, can be employed. It is here that a botanical garden comes into its own, particularly if its interpretive service is stimulating and imaginative.

In the light of these considerations, one point was allocated for each box ticked or for each other valid place named, a maximum of seven points being attainable. It was considered unreasonable to expect a pupil of 17 years to have visited more than seven such places, but this limit was not entirely arbitrary as both this decision and the choice of which conserved areas to list were based on the pilot surveys referred to in Chapter 4. In the event, 20 pupils listed more than seven conserved areas, while one area in Southern Natal, Oribi Gorge Nature Reserve, was shown to be the only significant omission. Umfolozi-Hluhluwe and Mkuzi-Ndumu (often respectively, but perhaps unfairly, regarded as the tourist's versus the conservationist's reserves) were grouped together as they appeared from the pilot survey to be visited largely in this way. In retrospect this should perhaps not have been done. Several pupils deleted part of the combinations. Figure 6.1 shows the location of conserved areas listed in the text in relation to the spatial location of the survey.

The specific purposes of the question were:

- a. To see which conserved areas were most frequently visited by the sample group — with an eye to further long term investigation, and development of conservation education programmes and production of educational material.
- b. To compare the variety of conserved areas visited with the corresponding CAWT scores.

The answers to 'a', (subject to the locational constraint noted in section 4.3), are contained in Table 6.10 and shown visually in Figure 6.2. The implications for the provision of good interpretive services and other educational material and opportunities are several. While it is not the intention of this survey to draw invidious comparisons, one cannot avoid, in view of the high proportion of visitors, raising the question of the very poor interpretive service offered at the Natal Lion Park. An enormous potential for the creation of conservation awareness fails to be utilised. To a lesser extent the same criticism might be levelled at Queen Elizabeth Park, the Zululand Reserves and the Kruger National Park where overall, the standard is, by international comparison, poor. Similarly, considering that the botanical garden figures probably relate almost entirely to Pietermaritzburg and Durban, the development of interpretive services there too requires serious attention.



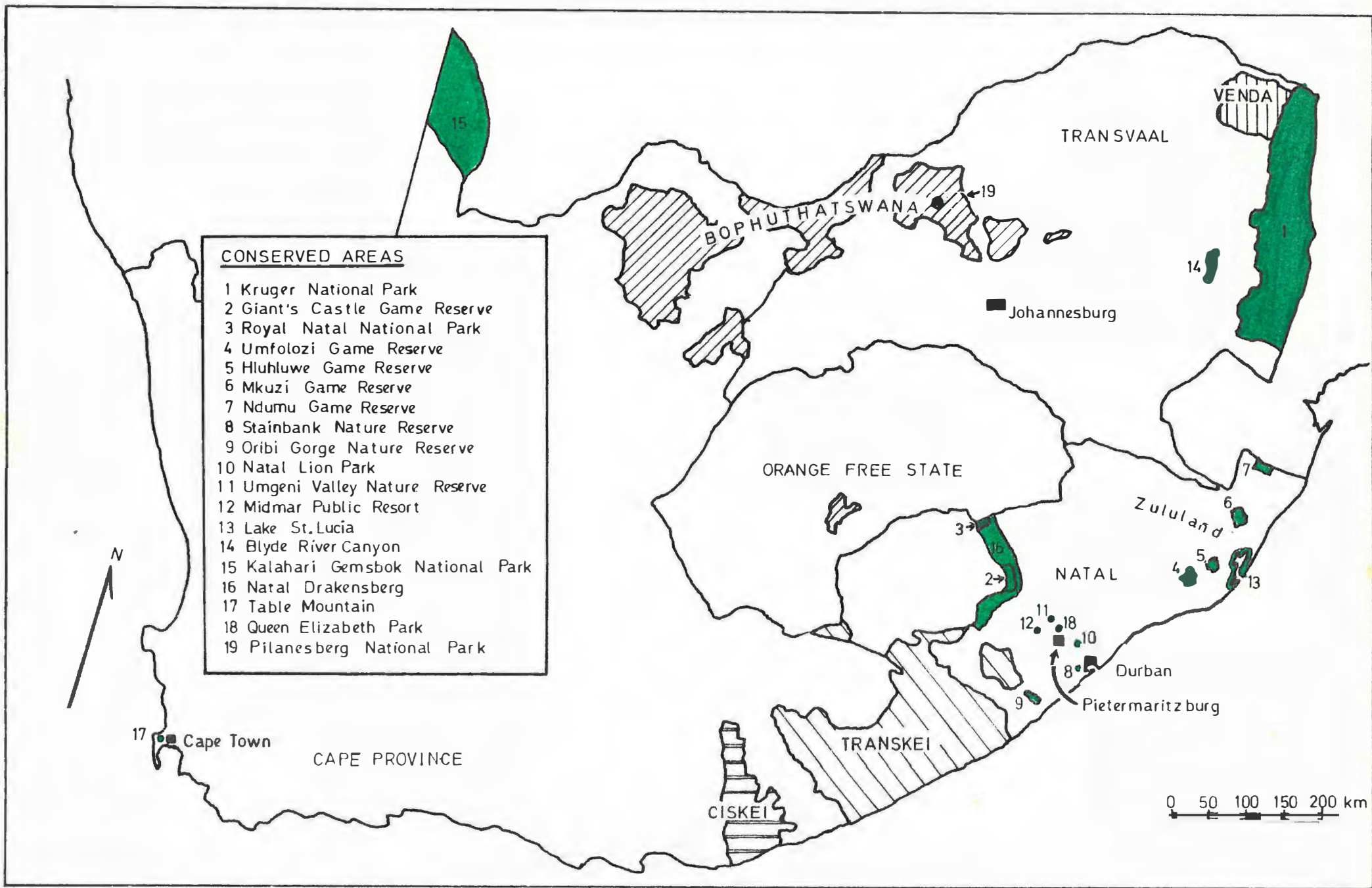


FIGURE 6.1 MAP OF GREATER SOUTH AFRICA SHOWING POSITIONS OF CONSERVED AREAS REFERRED TO

TABLE 6.10 VISITS TO CONSERVED AREAS BY STANDARD GROUPING EXPRESSED NUMERICALLY AND AS A PERCENTAGE OF EACH SUBGROUP

CONSERVED AREA	TOTAL.		U		R		♂		♀		A		E	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Giant's Castle Game Reserve	83	27,12	44	22,33	39	35,78	44	28,03	39	26,17	28	22,95	55	29,89
Royal Natal National Park	79	24,50	40	20,31	39	35,78	43	27,39	36	24,16	24	19,67	55	29,89
All other Drakensberg areas	13	4,25	7	3,55	6	5,50	9	5,73	4	2,68	3	2,46	10	5,43
<u>Total Drakensberg</u>	175	57,19	91	46,19	84	77,06	96	61,15	79	53,02	55	45,08	120	65,22
Umfolozi - Hluhluwe	91	29,74	60	30,46	31	28,44	44	28,03	47	31,54	18	14,75	73	39,67
Mkuzi - Ndumu	33	10,78	22	11,17	11	10,09	21	13,38	12	8,05	6	4,92	27	14,67
All other Zululand areas	12	3,92	10	5,08	2	1,83	6	3,82	6	4,02	3	2,46	9	4,89
<u>Total Zululand</u>	136	44,44	92	46,70	44	40,37	71	45,22	65	43,62	27	22,30	109	59,24
Natal Lion Park	229	74,84	157	79,70	72	66,06	123	78,34	106	71,14	95	77,87	134	72,83
Queen Elizabeth Park	92	30,06	60	30,46	32	29,36	40	25,48	52	34,90	51	41,80	41	22,28
Oribi Gorge Nature Reserve	40	13,07	29	14,72	11	10,09	23	14,65	17	11,41	20	16,39	20	10,87
Stainbank Nature Reserve	29	9,48	23	11,68	6	5,50	11	7,00	18	12,08	3	2,46	26	14,13
All other Natal areas	20	6,54	12	6,09	8	7,34	8	5,09	12	8,05	5	4,09	15	8,15
<u>Total Natal*†</u>	721	235,62	464	235,53	257	235,77	372	236,94	349	234,23	256	209,83	465	252,72
Total Cape Province*	29	9,48	19	9,60	10	9,17	20	12,74	9	6,04	10	8,19	19	10,37
Total Orange Free State*	12	3,92	8	4,06	4	3,67	8	5,09	4	2,68	4	3,28	8	4,35
Total Transvaal**	5	1,63	4	2,03	1	0,92	2	1,27	3	2,01	3	2,46	2	1,08
Kruger National Park	139	45,42	76	38,58	63	57,80	75	47,77	64	50,33	55	45,08	84	45,65
All other National Parks	19	6,21	12	6,09	7	6,42	15	9,55	4	2,68	3	2,46	16	8,69
<u>Total RSA†</u>	906	296,08	571	289,85	335	309,33	477	303,82	429	287,92	328	263,85	578	314,13
Rest of Africa	1	0,33			1	0,92	1	0,64					1	0,54
Rest of World	1	0,33	1	0,51			1	0,64					1	0,54
'A Botanical Garden'	228	74,51	154	78,17	74	68,88	111	70,70	117	78,52	94	77,05	134	72,83
n	306		197		109		157		149		122		184	

N = 306

\* Including National Parks.

\*\* Excluding Kruger National Park.

† Botanical gardens have been excluded from these totals as

a. It was not possible to determine whether the botanical garden marked was in Natal.

b. They were considered to be sufficiently different in concept from the other areas to justify a separate category.

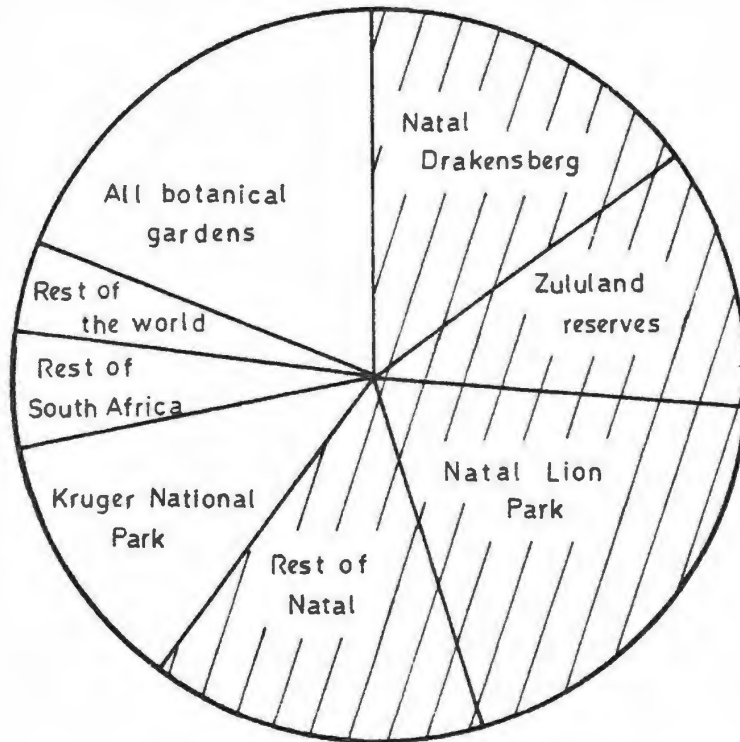


FIGURE 6.2 PIE-GRAPH SHOWING PROPORTIONAL NUMBER OF VISITS TO VARIOUS CONSERVED AREAS BY THE SAMPLE GROUP

- NOTES:
1. Botanical gardens excluded from all other categories. Most visits are probably in Natal.
  2. Natal total hatched.
  3. Rest of the World includes SWA/Namibia.
  4. Rest of South Africa includes all national parks other than Kruger and Royal Natal.

The case of the Stainbank Reserve deserves special mention as it appears to be a classic case of high quality resources on one's doorstep being neglected in favour of supposedly greener pastures further afield. The area had been visited by only 21 out of 120 pupils surveyed in Durban schools and of these 11 pupils had been on one school visit. There are also at least six other small conserved areas in the Durban area (Geerds & Brynjar, 1980) which are suitable for school visits and utilization,

but not one was listed by pupils. To be fair, however, this phenomenon is not confined to South Africa, but is commonplace in Western Europe and North America. Perhaps the best example is at the world famous Wildfowl Trust at Slimbridge in England. It has outstanding educational facilities, is visited annually by over 100 000 people, including 30 000 pupils in school groups from as far afield as Eastern Europe, but up to 1978, had never been visited by the local grammar school two kilometres away! (J. Blossom, pers. comm.\*).

Another feature of note is that apart from the Kruger National Park, the vast majority of all visits take place within Natal itself i.e. 91,07%, if the botanical gardens were to be included, and 69,19% if they are excluded. By contrast, on a linear extrapolation of the sample to the target group, only 100 pupils would have visited the Kalahari Gemsbok Park, South Africa's second largest park after Kruger, and only 25 pupils would have visited the Blyde River Canyon which, after Table Mountain, Cape Town, is South Africa's second most important tourist attraction. Thus, clearly, responsibility for the utilization of conserved areas for the development of conservation awareness in Natal rests largely with the province itself.

Two other minor points are of interest. Of the 84 pupils who had been on 'Joint Venture' courses at the Umgeni Valley Nature Reserve, only two listed it as one of the conserved areas they had visited. Possibly it was perceived as an extension of school or simply as something 'different'. The other point is that although a considerable proportion of the sample group are likely to have visited Midmar Public Resort, only one pupil mentioned it. Either school pupils are more discriminating than they are given credit for, or else very few have visited the adjacent nature reserve there. Perhaps those who have, have perceived it as an open zoo rather than in the categories under discussion.

The relationship of CAWT scores to 'conserved areas visited' is subject to two constraints.

- a. Because of the assumption that all areas were of potentially equal

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\* J. Blossom, Chief Education Officer, Wildfowl Trust, Slimbridge, Gloucester, GL2 7BT. England.

value, and the small numbers of the sample visiting some areas, no analyses of scores relating to individual conserved areas were carried out.

- b. Because no information was obtained on repeat visits to individual areas, the score can only be related to variety of areas visited, thus dealing with only part of the answer.

The results, shown in Table 6.11, suggest a general trend of increasing scores with increasing variety. If the two sets of data are correlated statistically, using the Product Moment coefficient of correlation,  $r = 0,78$ , which is high. Of particular note is the very high proportion of pupils, 97,06% (297/306), who have visited at least one conserved area. Even if botanical gardens are excluded from the count, the figure is 90,85% (278/306) which must be among the highest in the world. Other than the USSR and East European states, which claim close to 100%, no reliable comparative figures are available. In the case of the United Kingdom figures suggested to the researcher by a number of individuals were in the range of 14% - 18%. One may wonder what the figure for other population groups in South Africa would be.

TABLE 6.11      RELATIONSHIP OF VARIETY OF CONSERVED AREAS VISITED TO CAWT SCORE

NO. OF AREAS VISITED	PUPILS INVOLVED		AVERAGE CAWT SCORE (%)
	n	% of N	
0	9	2,94	56,44 *
1	28	9,15	53,00
2	49	16,01	52,65
3	55	17,97	53,02
4	66	21,57	57,33
5	27	8,82	54,52
6	32	10,45	60,25
7	20	6,54	66,40
8	11	3,89	55,64
9	8	2,61	71,15
10	0	0,00	N/A
11	1	0,33	92,00

N = 306

Thus, in conclusion, one might validly observe that, allowing for other variables, there is a relationship between levels of conservation awareness and visits to conserved areas and that the relationship is amplified by frequency of visits. We are unable to draw any conclusions on the relative conservation awareness value of different types of conserved area or of different individual areas.

6.2.7 Question A9: Do you go to these sort of places;

once every few years	<input type="checkbox"/>
once a year	<input type="checkbox"/>
three times a year	<input type="checkbox"/>
once a month	<input type="checkbox"/>
more often than once a month	<input type="checkbox"/>

AVI: "This refers to anything you've marked or written in question A8."

The purpose of the question was to gain an idea of the frequency of visits to the sort of places dealt with in question A8. There is a major shortcoming in as far as the questions do not correlate directly, but the pilot surveys had suggested that combination of the two would have led to wide confusion and inadequacy of responses, as indeed was the case even with the relatively simple combination of requirements in question A7. (This does not suggest that such a combination would not be possible, but rather that within the time constraint, it was not feasible). A further minor shortcoming is that the time intervals are not regular, so that any future statistical treatment of the data is relegated to the level of the nominal scale. It does not however affect this survey.

The scoring system was to rank the responses from 1 to 5 corresponding with increasing frequency and to use these figures as points for the IBE. The assumption was that increasing frequency would represent increasing enrichment in conservation awareness terms. The maximum number of points attainable was five. The number of pupils indicating each of the categories offered in the question together with the relevant CAWT scores for each frequency level are shown in Table 6.12. As only 274 pupils responded, it is presumed that the remaining 32 who had responded to question A8 either did not understand the question as it is or did not know the answer.

TABLE 6.12 FREQUENCY OF VISIT IN RELATION TO AVERAGE CAWT SCORE

FREQUENCY	NO. OF PUPILS INVOLVED	AVERAGE CAWT SCORE (%)
Once every few years	172	56,48
Once a year	55	56,58
Three times a year	41	57,12
Once a month	5	63,20
More often than once a month	1	40,00

N = 274

Although the results show a positive trend for the first three categories, accounting for 97,81% of the responses, the increase is minimal, making the results of dubious value and bringing into question the method of point allocation as well as the contributory value of the question. This could not however have been foreseen. If, despite the shortcomings of the data, frequency is matched against number of places visited, as shown in Table 6.13, it is seen that variety and frequency correspond only up to a certain point, after which there is a sharp decline. Plotting this data diagrammatically, as in Figure 6.3, it is clear that most pupils

TABLE 6.13 RELATIONSHIP OF VARIETY TO FREQUENCY OF VISITS TO CONSERVED AREAS\*

NUMBER OF AREAS VISITED	FREQUENCY:				
	Once every few years	Once a year	Three times a year	Once a month	More often than once a month
0	0	0	0	0	0
1	22	1	1	0	0
2	32	3	3	0	0
3	35	7	7	0	1
4	32	19	10	2	0
5	15	6	7	0	0
6	17	7	5	2	0
7	9	4	6	1	0
8	4	3	3	0	0
9	4	4	0	0	0
10	0	0	0	0	0
11	0	1	0	0	0

\* Shaded area shows data concerning Question C9 referred to in section 8.5.1.

N = 274

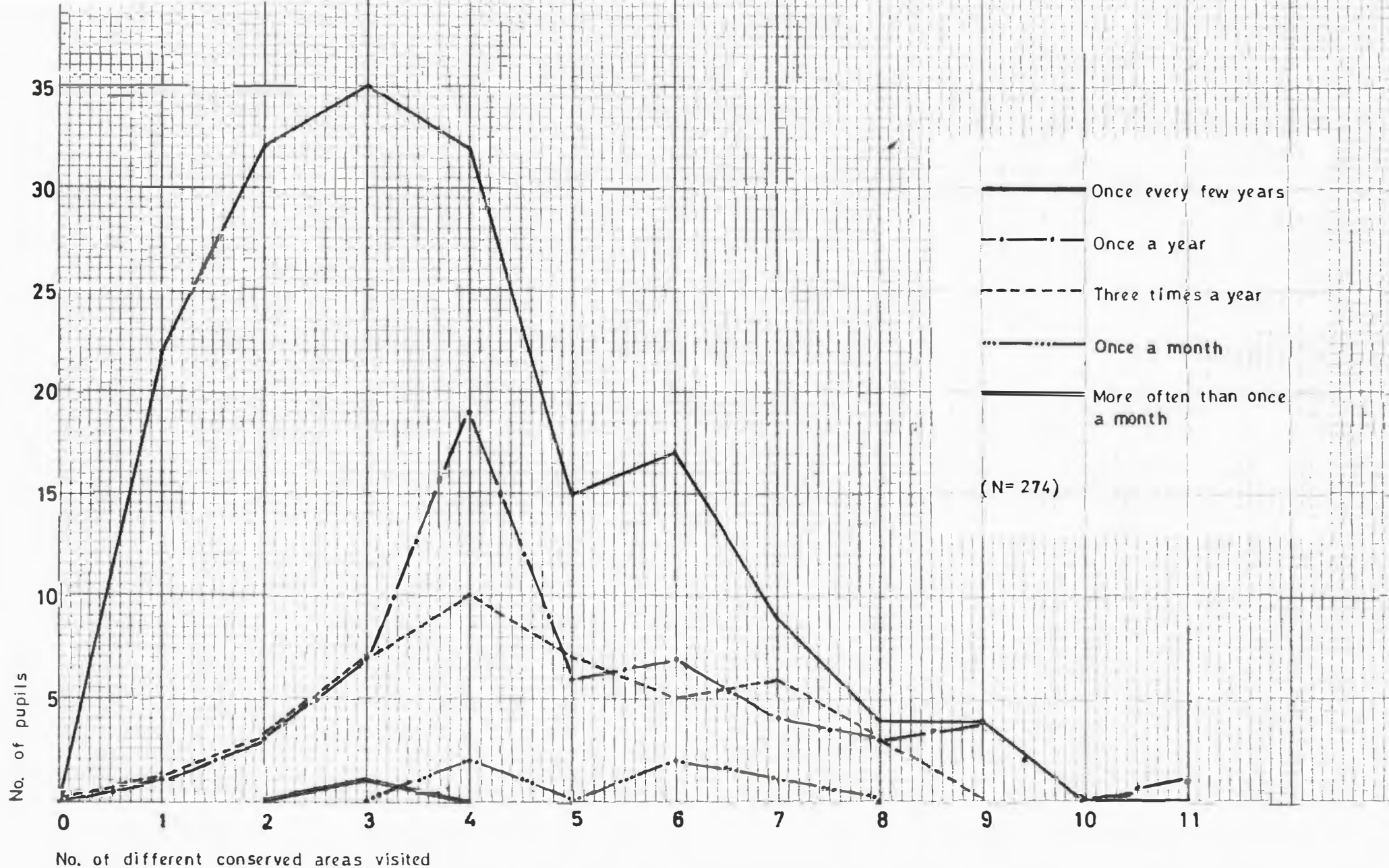


FIGURE 6.3 FREQUENCY POLYGON SHOWING VARIETY OF AREAS VISITED, FREQUENCY OF VISITS, AND NUMBERS OF PUPILS INVOLVED



visited a conserved area once every few years and had experienced a variety of three or four of these places. It also suggests that beyond a certain point, increasing frequency probably means visiting the same area(s) as previously visited either because it is convenient or has for some reason become a favourite place — usually on the part of the parent, teacher or tour organiser. If the CAWT scores of the 32 'mini-groups' for whom data is shown in Table 6.13 are compared, it is found that scores tend to increase with frequency of visit only if accompanied by variety, but once again increases are so small that no decisive conclusions can be drawn.

6.2.8 Question A10: Do you usually go with;

- |                         |  |
|-------------------------|--|
| your parents            |  |
| friends or relatives    |  |
| the school or a teacher |  |
| a youth or church group |  |

The factors comprising this question should ideally have been included in a matrix with questions A8 and A9. Had these interrelationships been the focal point of the survey this would have been imperative, but this was not done for reasons similar to those given in the case of question A9. The question has not been included in the scoring of the IBE as the relative importance of each of these factors in environmental education appears to be unknown. The researcher was unable to trace any literature relating to the topic.

The most characteristic feature of the responses to the question was the proportion (32,68%) responding to more than one of the options offered. As a result it was decided to accept the marking of two boxes, but considering the question incorporated the word 'usually', not three or four. Such indications were treated as non-answers. Accordingly, only 280 pupils' responses were accepted, the results of which are shown by standard groupings in Table 6.14. Scrutiny of the table brings out the following points:

- a. The majority of pupils have been to conserved areas with their parents. A total of 225 (80,35%) of those answering listed their parents, and of those a majority go only with their parents. The relatively small numbers going with a youth or church group tie in closely with the results of question A6. School tours account for only a small proportion. No comparative figures are available for other countries or sectors of the South African population.

TABLE 6.14 RESPONSES TO QUESTION A10 BY STANDARD GROUPING EXPRESSED NUMERICALLY AND AS A PERCENTAGE OF n.

RESPONSES AND COMBINATIONS	TOTAL		U		R		♂		♀		A		E	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Only with parents	139	49,64	89	47,85	50	53,19	73	52,52	66	46,81	50	44,64	89	52,98
Only with friends/relations	36	12,86	28	15,04	8	8,51	19	13,67	17	12,06	15	13,39	21	12,50
Only with the school/a teacher	12	4,29	12	6,45	0	0,00	4	2,88	8	5,67	3	2,68	9	5,36
Only with a youth/church group	4	1,43	3	1,61	1	1,06	2	1,44	2	1,42	3	2,68	1	5,95
Parents + friends/relatives	56	20,00	37	19,89	19	20,21	26	18,71	30	21,28	24	21,43	32	19,05
Parents + school/teacher	20	7,14	10	5,38	10	10,64	6	4,32	14	9,93	8	7,14	12	7,14
Parents + youth/church group	10	3,57	6	3,23	4	4,26	6	4,32	4	2,84	8	7,14	2	1,19
Friends/relatives + school/teacher	2	0,74	1	0,54	1	1,06	2	1,44	0	0,00	0	0,00	2	1,19
School/teacher + youth/church group	1	0,37	0	0,00	1	1,06	1	0,72	0	0,00	1	0,89	0	0,00
n	280	(100%)	186	(100%)	94	(100%)	139	(100%)	141	(100%)	112	(100%)	168	(100%)

N = 280

Records for the Umgeni Valley show however that no Black children and very few Indian or Coloured children have visited in the company of their parents, the normal mode in this case being a school or group outing. It is suggested that this pattern is possibly a countrywide phenomenon, and is probably a function of factors such as economic priorities, affluence, availability of areas to visit and cultural habits.

- b. In terms of sub-groups, rural, male and English speaking pupils are more likely to go with their parents only than are their counterparts, while urban pupils are most likely to travel with relatives. Afrikaans speaking pupils are marginally most likely to visit conserved areas with youth, church or school groups. The pattern in other provinces, particularly in the Transvaal, where the concept of school tours is well developed, may differ substantially.

When the responses are compared with CAWT scores as in Table 6.15, an interesting picture emerges. The highest scores with large numbers of pupils involved (and which are therefore statistically more reliable) correspond to those categories in which parents are involved. The total average of CAWT scores for categories with parental involvement is 56,96% as opposed to 54,32% for categories with non-parental involvement. Analysis of the difference between the means results in the rejection of the  $H_0$  at the 95% level of confidence, indicating that the difference is very likely due to factors other than chance — in this case probably the influence of the parents themselves. Further analyses of parental occupation in relation to the responses and CAWT scores failed to show any pattern linking parental involvement with occupation, other than the points established in section 6.2.1 above.

TABLE 6.15    RESPONSES TO QUESTION A10 IN RELATION TO CAWT SCORES

RESPONSES AND COMBINATIONS	NO. OF PUPILS INVOLVED	% OF N	AVERAGE CAWT SCORE (%)
Only with parents	139	49,64	57,50
Only with friends/relatives	36	12,86	55,33
Only with the school/a teacher	12	4,29	49,83
Only with a youth/church group	4	1,43	50,00
Parents + friends/relatives	56	20,00	55,43
Parents + school/teacher	20	7,14	57,60
Parents + youth/church group	10	3,57	56,80
Friends/relatives + school/teacher	2	0,74	64,00
School/teacher + youth/church group	1	0,37	70,00

N = 280

It may thus be concluded tentatively that, allowing for other non-isolated variables, parental involvement in conservation related experiences of the pupils may have a positive influence on conservation awareness. The other significant point to emerge is that there is a major vacuum waiting to be filled by schools, teachers and youth organisations, strongly reinforcing the conclusions arrived at from question A6.

6.2.9 Question A11: Have you ever had a teacher who strongly encouraged you to take an interest in wildlife?

The question was included as it was felt that for many children their teachers could be both their initiation into and their major continuing link with conservation. The value of the score to be apportioned to this question was a difficult decision, but after weighing it up in relation to other activities, it was eventually decided to give it parity with question A14 on books, and to give both a value of four.

296 pupils answered the question, the response patterns being shown by standard and selected grouping in Table 6.16. The overall results speak largely for themselves, and despite an anomaly such as the RE sub-group and an extreme stance such as the m sub-group, they are fairly consistent in trend, if less so in dimension. What is of more concern than the details of the response pattern is the overall relationship of YES to NO responses, and the major implications which arise from this i.e. the teacher's own level of conservation awareness, the extent to which they transmit this to their pupils, and what the pupils perceive.

A clue to the level of teachers' conservation awareness has been given in Chapter 5, while in question A10 attention was drawn to the under-exploitation of the school tour or excursion in visiting conserved areas. The relationship of certain subjects to conservation awareness has also been examined. Viewing the present results in this context inevitably reinforces an already lurking feeling that the formal education system is not having the impact it might or should have on the creation and development of this vital area of education. It would be very unfair to place the responsibility for this situation squarely at the doors of teachers, given the value systems within which they work and the training, both which they

TABLE 6.16 RESPONSES TO QUESTION A13 BY STANDARD AND SELECTED GROUPING (%N/n)

RESPONSE	TOTAL	U	R	♂	♀	A	E	UA	RA	UE	RE	m	f	M	F	n
YES	44,26	41,04	40,58	46,00	42,47	34,48	50,55	31,94	38,64	46,61	58,06	25,53	40,58	55,34	44,16	131
NO	55,74	58,96	59,42	54,00	57,53	36,52	49,45	68,06	61,36	53,39	41,94	74,47	59,42	44,66	55,64	165
n	296	190	106	150	146	116	180	73	43	117	63	46	70	104	76	

N = 296

have and do not have, a point to which attention was drawn in Chapter 3. It is also true that in Natal schools at least, sporting activities nearly always receive priority consideration over cultural activities and issues such as conservation. While a broad concept of conservation may occasionally receive attention at in-service courses, to the writer's knowledge, the only regular in-service training programme is that of ACE, also referred to in Chapter 3. As stated there too, practising teachers are often left out in the cold when the matter of environmental or conservation education is debated or discussed.

An interesting contrast to the situation described exists in Britain, where not only do practising teachers constitute a significant proportion of the contributors to environmental education journals such as BEE and REED, but teachers in training are increasingly required to participate in environmental awareness courses (U. Bowen, pers. comm.\*). A similar situation exists in several other European countries and the USSR\*\*.

The second implication of the results i.e. the extent to which the teachers transmit their conservation values, is part of a much broader question on the general transmission of values and one beyond the present scope of investigation. It is a sobering thought though, that at the end of at least 10 years of formal schooling, less than half of the pupils in the sample could give a positive answer to the question.

When the results of the standard groupings shown in Table 6.16 are compared with the CAWT scores in relation to responses as shown in Table 6.17, the picture which emerges is that allowing, as has been done elsewhere, for other variables, teachers' influence, as seen by the pupils, does on the whole have a moderately positive influence on the scores. The influence is however uneven and sometimes negative.

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\* U. Bowen, Head of Sciences Department, Lady Spenser-Churchill College of Education, Oxford. Also: Biology Department, Oxford Polytechnic, 20 Winchester Road, Oxford.

\*\* Soviet Weekly, 15/7/1978.

TABLE 6.17 AVERAGE CAWT SCORES FOR RESPONSES TO QUESTION A11 BY STANDARD GROUPING

RESPONSE	TOTAL	U	R	♂	♀	A	E
Y CAWT %	58,38	60,30	55,55	64,35	51,74	51,10	61,58
E S n	131	78	53	69	62	40	91
N CAWT %	54,28	54,04	54,79	55,70	52,90	54,84	53,79
O n	165	112	53	81	84	76	89
AVERAGE CAWT SCORE	56,46	56,30	56,73	60,40	52,30	53,70	58,28
TEACHER EFFECT*	Moderately +	Moderately +	Slightly -	Very +	Slightly -	Moderately -	Very +

\* As perceived by pupils.

N = 296

6.2.10 Question A12: Do you regularly read:

African Wildlife	
Custos	
Toktokkie	
Flora and Fauna	
Ostrich	
Bokmakierie	
Krantz	

AVI: "Write underneath this list any other magazines on nature conservation which you regularly read."

The list represents popular conservation magazines available to pupils at the time of the survey. Krantz has subsequently been incorporated into Great Outdoors, Toktokkie has expanded in size and circulation and 10-Plus, an Afrikaans encyclopaedic magazine, has appeared with a substantial conservation content. Although Ostrich is essentially a scientific journal, it was included as any member of the S.A. Ornithological Society, or one of its bird clubs would receive it. Custos and Flora and Fauna are fully bilingual, while the others publish articles in the language in which they receive them, the result being that they are predominantly English in content. It was assumed that at least some of the listed magazines would be available in every school's library, but it turned out that this was not in fact so: there were three schools in which none of the listed magazines were available. One point was allocated for each magazine read, up to a maximum of four, which was considered a reasonable limit for a 17 year old. The final result suggested that three might have been more reasonable.

From a conservation viewpoint, figures relating to readership given in Table 6.18 are useful, as magazines are in general among the primary tools for communicating both knowledge and values. The known extent of who reads what, is also important in determining both the content and level of what is presented. The table is largely self explanatory, with 137 pupils claiming that they regularly read one or more of the listed magazines. Of these 91 pupils marked only one magazine and 48 pupils two or more. The term 'regular' is a relative one and so of course is the term 'to read', so that any conclusions relating to the actual transmission or reception of ideas must be viewed with considerable circumspection.



TABLE 6.18 MAGAZINE READERSHIP BY STANDARD GROUPING EXPRESSED NUMERICALLY AND AS A PERCENTAGE OF SUB-GROUP TOTAL

	TOTAL		U		R		♂		♀		A		E	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
African Wildlife - total	99	32,35	59	29,95	40	36,70	57	36,30	42	28,19	35	28,69	64	34,78
Custos - total	60	19,60	32	16,24	28	25,69	40	25,48	20	13,42	27	22,13	33	17,93
Flora and Fauna - total	20	6,54	8	4,06	12	11,00	11	7,00	9	6,04	12	9,84	8	4,35
African Wildlife - only	56	18,30	39	19,80	17	15,60	26	16,56	30	20,13	23	18,85	33	17,93
Custos - only	26	8,50	14	7,10	12	11,00	15	9,55	11	7,38	18	14,75	8	4,35
Flora and Fauna - only	8	2,61	5	2,54	3	2,75	2	1,27	6	4,03	7	5,74	1	0,54
African Wildlife and Custos	31	10,13	16	3,12	15	13,75	23	14,65	8	5,37	7	5,74	24	13,04
Toktokkie	6	1,96	3	1,52	3	2,75	5	3,18	1	0,67	0		6	3,26
Ostrich	4	1,31	4	2,03	0		2	1,27	2	1,34	2	1,64	2	1,08
Bokmakierie	5	1,63	3	1,52	2	1,84	3	1,91	2	1,34	2	1,64	3	1,63
Krantz	0		0		0		0		0		0		0	
African Wildlife & Flora and Fauna	8	2,61	1	0,50	7	6,42	7	4,46	1	0,67	2	1,64	6	3,26
Custos & Flora and Fauna	3	0,98	2	1,01	1	0,92	2	1,27	1	0,67	2	1,64	1	0,54
African Wildlife & Toktokkie	5	1,63	3	1,52	2	1,84	5	3,18	0		0		5	2,72
African Wildlife, Ostrich & Bokmakierie	6	1,96	4	2,03	2	1,84	3	1,91	3	2,01	3	2,46	3	1,63
Custos, Ostrich, Bokmakierie & Toktokkie	6	1,96	3	1,52	3	2,75	6	3,82	0		0		6	3,26
NO. OF PUPILS READING A MAGAZINE	137	44,77	80	40,60	57	52,29	76	48,40	61	40,94	62	50,82	75	40,76
n	306		197		109		157		149		122		184	

N = 306

With reference to the standard groupings, rural, male and Afrikaans speaking pupils are most likely to read one of the listed magazines. The extent of 'readership' of predominantly English language magazines by Afrikaans speaking pupils suggests a clear willingness on their part at least to look at English magazines, but on data available it is not possible to say to what extent this attitude would be reciprocated by English speaking pupils.

It is not intended to assess and compare the relative merits and worth of each magazine, either in general or in conservation education terms, nor to comment on how well the material relates to the target group, but the relationship of CAWT scores to the three top magazines, individually and in combination, would make interesting reading for both conservationists and the publishers. This information, presented in Table 6.19, suggests that Custos, the monthly magazine of the National Parks Board, may have the edge on its rivals in this respect. The possibility also exists of course that the questions asked in the CAWT were more likely to be of the type covered in Custos and African Wildlife, the general interest magazine of the Wildlife Society of Southern Africa, or in Flora and Fauna, the magazine of the Transvaal Division of Nature Conservation. If this in fact is the case, it was certainly not intended and it is suggested that the differences lie rather in the style and content of the magazines themselves.

TABLE 6.19      RELATIONSHIP BETWEEN MAGAZINE READERSHIP AND CAWT SCORES

MAGAZINE(S)	NO. OF PUPILS INVOLVED	AVERAGE CAWT SCORE (%)
African Wildlife only	55*	56,58
Custos only	29**	58,76
African Wildlife (all readers)	99	58,17
Custos (all readers)	60	60,73
African Wildlife and Custos	31	63,61
Flora and Fauna (all readers)	20	58,80
African Wildlife plus all except Custos	18	62,00
Custos plus all except African Wildlife	9	68,44

\* Of this total 22 (40%) were Afrikaans-speaking.

\*\* Of this total 22 (75,86%) were Afrikaans-speaking.

Where the number of different magazines read is related to CAWT scores, as shown in Table 6.20, a consistent but not definitive trend emerges as numbers for the 3, 4 and 5 categories are too small. Furthermore the difference in average CAWT scores between the 169 'non-readers' and the 137 'readers' (with a CAWT average of 57,20%) is too small to make any definitive judgements on the value of these magazines in relation to conservation awareness.

TABLE 6.20      RELATIONSHIP BETWEEN NUMBER OF MAGAZINES READ AND CAWT SCORE

NUMBER OF MAGAZINES	NO. OF PUPILS INVOLVED	AVERAGE CAWT SCORE (%)
0	169	55,86
1	91	56,13
2	37	57,19
3	7	65,14
4	1	80,00
5	1	84,00

The major implication arising from the results of this question is the need in South Africa for a bilingual conservation magazine aimed specifically at different sections of the school-going population. During 1979 the new Toktokkie started out this way, but most unfortunately six months later reverted to an exclusively English publication aimed only at the primary school level. It has subsequently branched out into separate Afrikaans and English editions containing separate material. To some extent 10-Plus has filled the gap for Afrikaans speaking secondary pupils, but for neither of these two magazines is there any feedback on their impact.

#### 6.2.11 Question A13: What are your major hobbies?

It was accepted at the outset that the interest, intensity and duration with which a hobby was or had been pursued by an individual could not be measured by a simple question of this nature. Cognisance was taken of the fact that interest alone is not a guarantee of conservation awareness and

that the separation of cause and effect is probably more difficult in this question than in any other asked in the survey. Hobbies may equally be the result of enrichment, as well as its cause. Either one or two points were allocated to any hobby which could reasonably be considered as conservation-orientated, so that two hobbies on the fringe of conservation could earn one point each. The maximum number of points was limited to two as it was felt that beyond this a pupil would be duplicating activities.

A total of 278 pupils responded to the question and of these 81 (26,47% of the sample), spread more or less evenly among the standard groupings, named conservation-orientated hobbies. Details of these and the relationship of particular hobbies to CAWT scores are given in Table 6.21. Although actual numbers of pupils involved in different pursuits are too small for meaningful individual comparisons, several points arise from the data viewed as a whole.

Firstly, the difference between the average CAWT scores of the 81 'conservation minded hobbyists' and the 225 non-conservation hobbyists is statistically significant (the critical ratio,  $t = 2,62$ ). Moreover if the more strictly 'wildlife' hobbies i.e. those marked with an asterisk in Table 6.21, are considered as a separate group, their average CAWT score rises to 61,12%, thus indicating a clear positive relationship between conservation-orientated hobbies and conservation awareness and strongly reinforcing earlier conclusions on the importance of 'doing' and 'first hand experience'. Concomitantly it is noted that the more specific activities such as 'snakes' and 'fishing' are generally associated with higher CAWT averages than are the more generalised activities such as 'outdoor life', 'nature' or 'natuuruitstapje'.

It is noted too that the 81 respondents concerned are far in excess of the 19 stating current membership of wildlife societies, bird clubs and any other conservation organisation. While not everyone may wish to belong to clubs and societies, the size of the gap adds considerable weight to earlier assertions on the vacuum waiting to be filled by clubs, schools and teachers. From a conservationist view the results are, on the whole, encouraging in that over a quarter of the sample have an interest in a field into which conservation ethics and values can be integrated. On

TABLE 6.21 RELATIONSHIP BETWEEN CONSERVATION ORIENTATED HOBBIES AND CAWT SCORES

HOBBIES	PUPILS INVOLVED		AVERAGE CAWT SCORE (%)
	n	% of sample	
'Walking', 'natuuruitstappe', 'velduitstappe'	19	6,21	53,47
Fishing	15	4,90	67,20
'Wildlife', 'nature', 'conservation', 'wild animals'*	14	4,58	55,43
Hiking and mountaineering	9	2,94	69,78
Camping	9	2,94	60,00
Birds and birdwatching*	6	1,96	64,00
Rockclimbing	3	0,98	52,00
'Outdoor life'	3	0,98	52,00
Hunting and fishing	3	0,98	54,67
Snakes*	3	0,98	69,33
Farming, agriculture	2	0,65	74,00
Hunting	2	0,65	66,00
Wildlife photography*	2	0,65	80,00
TOTAL	81**	26,47	58,81†

\* These constitute the 'wildlife' hobbies referred to in the text.

\*\* Nine pupils listed more than one of the above hobbies.

† Average CAWT score for the 225 pupils not included = 55,61%

N = 81

the other hand, the high proportion of 'non-hobbyists' adds a tone of urgency for positive and clearly defined conservation awareness programmes to become incorporated into our education systems and way of life.

6.2.12 Question A14: Do you have books on wildlife at home?

AVI: "Note that we are referring to books and not magazines."

While it was assumed that the existence of books at home would be an enriching factor, it became apparent from questions asked during the survey, that there was some confusion as to what exactly a 'book' was. This is not an easy matter to define without being restrictingly rigid and having a considerable amount of time to explain the criteria. For example, while 'books' might clearly include hard cover encyclopaedias, should the category include weekly or monthly soft cover encyclopaedias with their magazine-like appearance, and if so, then why not monthly magazines bound together? Possibly either a more general term such as 'reading matter' should have been used or else a clear definition of 'books' given. In the event, pupils were left to judge for themselves what constituted 'books'.

Another issue to be taken into account in this question is the possible lie factor. While NO can probably be taken as an honest answer, YES is more dubious, for judging from post-test discussions some pupils seemed to feel they ought to have these items at home, and were unhappy about admitting that they did not. Thus at least a proportion of the high YES response must be considered either a lie or a confusion element. A further factor, not directly concerning this study, but which should nevertheless be borne in mind, is the extent to which pupils use and read books, even if they do have them at home. This sort of information is very difficult to obtain and would clearly be a research programme in its own right. In terms of the IBE score four points were allocated to this question as explained in section 6.2.9 above.

300 pupils responded to the question, the results, together with related CAWT scores, being given by standard grouping in Table 6.22. The major

points of note are:

- a. The very significant difference in average CAWT score between the YES and NO responses. Chance factors may be rejected at the 99,9% level of confidence.
- b. The different response patterns between Afrikaans and English speaking sub-groups. This is possibly a function of book availability in the conservation field. Very little exists in Afrikaans and the fact that this difference is not greater may suggest that Afrikaans speakers buy and own English books in this field.
- c. The fairly consistent level of CAWT performance amongst the NO group.

TABLE 6.22      RESPONSES TO QUESTION A14 IN RELATION TO CAWT SCORES BY STANDARD GROUPING (%N/n)

		TOTAL	U	R	♂	♀	A	E	n
YES	% of n	73,00	72,40	74,07	70,13	76,03	59,17	82,22	219
	Av. CAWT %	58,33	58,55	58,50	64,52	52,70	55,07	60,19	
NO	% of n	27,00	27,60	25,93	29,87	23,97	40,83	17,78	81
	Av. CAWT %	51,01	50,49	52,00	51,48	50,40	49,62	51,92	
n		300	192	108	154	146	120	180	

N = 300

An analysis of parental occupation and related CAWT scores (discussed in section 6.2.1) in relation to the responses to question A14 was carried out and is summarised in Table 6.23. Clearly the major point to emerge is that the children of professional parents claim to have substantially more books on wildlife available to them at home than do children of parents in non-professional occupations. Coupled to this however, is the possibility that if books are a major factor in environmental awareness, as indicated might be the case in Table 6.22, then this resource, enjoyed by the children of professional parents, might be substantially under-utilized.

TABLE 6.23 RELATIONSHIP BETWEEN RESPONSES TO QUESTION A14, PARENTAL OCCUPATION AND RELATED CAWT SCORES

PARENTAL OCCUPATIONS (FOLLOWING TABLE 6.4)	CORRESPONDING CAWT SCORES	NUMBER OF PARENTS INVOLVED ( $P_n$ )	NUMBER OF PARENTS WITH CHILDREN ANSWERING 'YES' ( $P_y$ )	$\frac{P_y}{P_n} \times \frac{100}{1}$
One parent professional	57,35	98	79	80,61
One parent commercial	57,74	124	78	62,90
One parent worker/artisan	52,45	71	46	64,79
Both parents professional	58,33	24	23	95,83
Both parents commercial	50,01	38	29	76,32
Both parents worker/artisan	58,00	2	0	0,00
One parent agricultural	63,84	49	37	75,51



6.2.13 Question C13: Do you have television at home?

Do you think that television has made you more aware of the complex problems of nature conservation?

Following the points made concerning this question in section 6.1 it is perhaps appropriate that it should be considered after questions A12, A13 and A14, all of which are in a sense part of, or depend upon, what is generally termed 'the media'. Bearing in mind that the survey took place during September and October 1978 and that the situation has probably altered to some extent since then, the responses to the question are given in Table 6.24.

TABLE 6.24    RESPONSES TO QUESTION C13 BY STANDARD GROUPING (%N/n)

First part

RESPONSE	TOTAL	U	R	♂	♀	A	E	n
YES	85,95	91,88	75,23	82,17	89,93	89,34	83,70	263
NO	14,05	8,12	24,77	17,83	10,07	10,66	16,30	43
n	306	197	109	157	149	122	184	

N = 306

Second part

RESPONSE	TOTAL	U	R	♂	♀	A	E	n
YES	79,93	81,58	77,06	76,47	83,57	73,60	89,26	239
NO	13,38	14,74	11,01	13,73	13,01	18,54	5,78	40
NOT SURE	6,69	3,68	11,93	9,80	3,42	7,86	4,96	20
n	299	193	106	153	146	121	178	

N = 299

The table shows that not only did the vast majority of the sample have television in their homes, but that a very high proportion of these pupils felt that television had made them more aware of the problems of conservation. Although most pupils probably believed that what they were

stating was true, and for many it no doubt was; related CAWT scores indicate that perspectives on this matter cannot be taken at face value. The 43 pupils who did not have television at home had a higher CAWT average than those who did have — 58,14% versus 56,18%. Although it is cause for exercising caution in the value accorded to the results, this anomaly is not as significant as it might at first appear to be. What the CAWT set out to measure was not necessarily related to the content of the conservation material being broadcast by SABC-TV up to that stage, nor was the CAWT intended in any way to assess the impact of conservation orientated programmes.

Finally, although this study has not included an evaluation of the quality of television programmes or their impact upon environmental and conservation awareness, this factor should not be overlooked in future research on environmental education. Sight must not be lost of the vast potential of this medium to create and develop environmental awareness among all sections of the population. How this may be best achieved and what approach is needed is a research project worthy of serious consideration.

6.2.14 Question A15: Have you ever heard of the:

Wildlife Society of Southern Africa

S.A. Nature Foundation

Natal Parks Board

National Parks Board

What do the letters IUCN stand for?

What do the letters WWF stand for?

The purpose of this question has been dealt with in section 6.1 above. The responses are best dealt with in two parts, national and international.

The first part comprises a list of South African conservation organisations which the target group might reasonably be expected to have heard of. The results, shown in Table 6.25, indicate a strong provincial orientation. Amongst all sub-groups the Natal Parks Board is better known than the National Parks Board and the Wildlife Society of Southern Africa, which maintains a relatively high profile in Natal, is better known than the

TABLE 6.25 RESPONSES TO QUESTION A15 (1st part) BY STANDARD GROUPING EXPRESSED NUMERICALLY AND AS A PERCENTAGE OF SUB-GROUP TOTAL

RESPONSE	TOTAL		U		R		♂		♀		A		E	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Wildlife Society of Southern Africa	156	51,83	95	48,97	61	57,01	86	56,58	70	46,98	21	17,36	135	75,00
South African Nature Foundation	31	10,30	17	8,76	14	13,08	19	12,50	12	8,05	15	12,40	16	8,89
Natal Parks Board	265	88,04	163	84,02	102	95,33	132	86,84	133	89,26	104	85,95	161	89,44
National Parks Board	215	71,43	138	71,13	77	71,96	104	68,42	111	74,50	89	73,55	126	70,00
n	301		194		107		152		149		121		180	

N = 301

Cape based South African Nature Foundation. An interesting speculation is whether the gap between the latter two organisations may have narrowed with the substantially increased publicity which the Foundation has enjoyed over the past three years, especially with regard to the Karoo and the Pilanesberg National Parks and big game translocations.

While the Natal Parks Board enjoys a high recognition status among all sub-groups, the same cannot be said of the Wildlife Society of Southern Africa. Although the differences between location and sex-groups is not great, it is enormous between Afrikaans and English speaking pupils. Quite clearly the English orientated 'Wildlife Society' is failing even to make itself known among the vast majority of Afrikaans speakers in the sample and probably in the target group. Such an image does not bode well for any organisation aiming to be a national force in both conservation and conservation awareness. Interestingly the number of Afrikaans pupils having heard of the Wildlife Society of Southern Africa (21) is less than the number claiming to read African Wildlife (35). There is thus either a non-linking factor between the Society and its magazine or a substantial lie factor in what is claimed to be read. Possibly it is a combination of both.

The second part of the question was answered by only nine pupils, as shown in Table 6.26. Two of the pupils were farmer's sons and two had travelled abroad. Only one pupil was able to give both answers. There is therefore an almost total lack of knowledge of even the existence of the two most important international conservation organisations. It is interesting however that the WWF should have 'scored' better as it is the parent body of the S.A. Nature Foundation, sharing the same panda logo.

TABLE 6.26      RESPONSES TO QUESTION A15 (2nd part) BY  
STANDARD GROUPING

RESPONSE	TOTAL	U	R	♂	♀	A	E
IUCN	3	3	0	2	1	1	2
WWF	7	7	0	5	2	1	6

N = 9

### 6.3 The Index of Background Experience

The underlying theory of the IBE has been covered in Chapter 4 and in section 6.1 above. The Index was arrived at by totalling the scores of all pupils in the sample for the questions demarcated in section 6.1, on the basis of the point allocations given in this chapter. Sums were obtained for each basic group whereafter the procedure followed was the same as for the Conservation Awareness Test except that raw scores were doubled and not quadrupled to give the final percentages. The gross IBE results are given in Tables 6.27 and 6.28 in a form directly comparable with the CAWT scores as shown in Tables 5.17 and 5.18 (pp. 110 and 111). Individual pupil scores ranged from 6% to 70% with an overall average of 31,63% and a standard deviation of 11.41. The dispersion of scores is shown visually for the total sample and the standard groupings in Figures 6.4 to 6.7, while the standard deviations are given for components of the basic, standard and selected groupings in the tables referred to above.

The positive skewing of the results allow the possibility that either:

- a. The upper potential set was too demanding i.e. experiences expected of pupils in order to achieve a sample mean of 50% were unreasonably high, or
- b. The range and variety of items in the Index was not wide enough to ensure a fair chance of a 50% mean, or
- c. The weighting of questions in relation to each other was so unsatisfactory as to distort the results i.e. there was numerical invalidity in terms of point allocation.

As far as 'c' is concerned, experimental juggling of the values allocated to questions (admittedly within subjective limits) indicated that only minor shifts in the overall index pattern would be achieved. In the case of 'b', while the assumption of construct validity suggests a low likelihood of this being a significant factor, the results indicate that the assumption itself is open to question insofar as it is not necessarily equally valid for all sub-groups within the sample. A case may be made that the IBE as a whole was not as appropriate to females as males within the sample — a matter pursued further when additional data is presented in the next chapter. Notwithstanding these points, the major part of the

TABLE 6.27 RESULTS OF THE IBE BY STANDARD AND SELECTED GROUPING FOR ALL SCHOOLS IN THE SAMPLE

	TOTAL	U	R	♂	♀	A	E	UA	RA	UE	RE	m	f	M	F	'X'*	'Y'*	'Z'*
AVERAGE % (m)	31,63	30,13	34,33	31,98	31,24	28,51	33,69	29,12	27,47	30,78	39,16	26,24	30,14	34,75	32,26	38,16	29,24	39,53
STANDARD DEVIATION (σ)	11,41	11,29	12,59	14,39	9,71	8,99	13,15	9,88	10,21	12,04	13,39	10,32	9,61	17,82	9,43	13,38	11,98	14,68
n	306	197	109	157	149	122	184	77	45	120	64	51	71	106	78	49	29	17

\* X = Farmer's children  
 Y = Pupils who have lived abroad  
 Z = Pupils studying agriculture

N = 306

explanation probably lies in the factors raised in point 'a'. In view of the experimental nature of the survey emphasised earlier, this is not however a serious indictment but rather an important point of consideration for future surveys.

TABLE 6.28 RESULTS OF THE IBE BY BASIC GROUPING

	TOTAL	Um	Uf	Rm	Rf	UM	UF	RM	RF
AVERAGE % (m)	31,63	28,00	29,87	23,50	30,64	31,03	30,53	39,60	38,00
STANDARD DEVIATION ( $\sigma$ )	11,41	10,21	9,72	9,88	9,39	14,80	8,42	14,38	10,37
n	306	31	46	20	25	60	60	46	18

N = 306

Assuming that a normal distribution curve were to be postulated as the ideal, results could be standardised to correspond to a pattern such as:

- 0% - 20% — very deprived
- 21% - 40% — relatively deprived
- 41% - 60% — normal
- 61% - 80% — relatively privileged
- 81% - 100% — very privileged.

If we compare the corresponding figures of the results (58, 184, 61, 3 and 0 respectively) with this, it would be quite incorrect to conclude that we had been dealing with a disadvantaged or deprived group. On the contrary, evidence has on several occasions in the question analysis been led to suggest that, certainly in the South African and possibly in the world context, the sample probably represents an exceptionally privileged group in terms of conservation-orientated experiences. Thus although the validity of the IBE figures as they stand are open to question, this would appear to be a matter of scale rather than one of unsound foundations. The scaling of expectations to a more reasonable level would be a normal process in the achievement of standardisation.

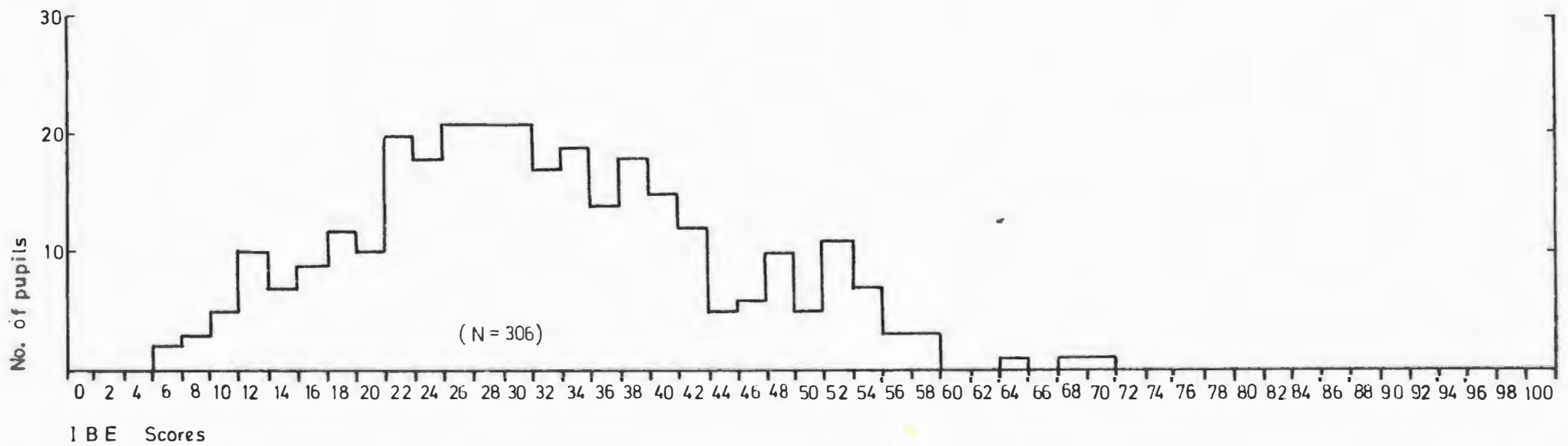


FIGURE 6.4 HISTOGRAM SHOWING DISTRIBUTION OF IBE SCORES FOR TOTAL SAMPLE



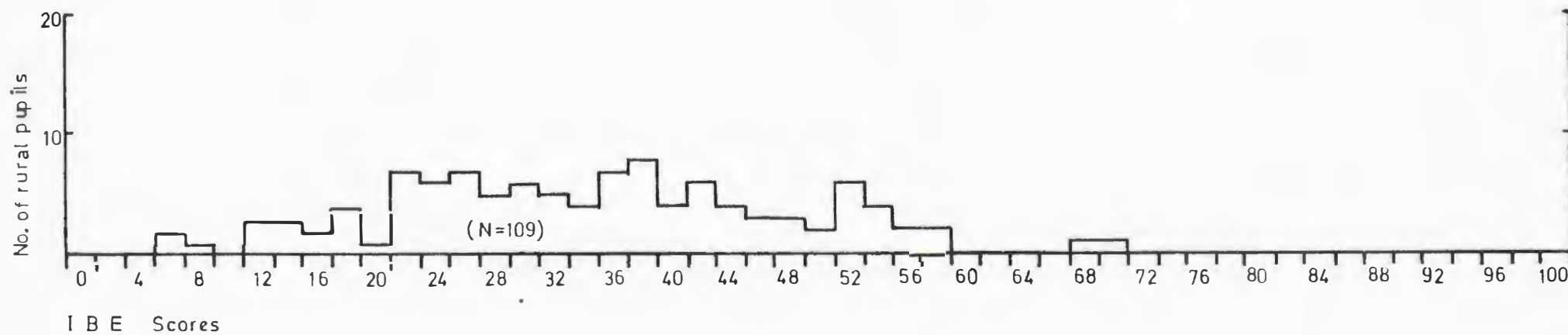
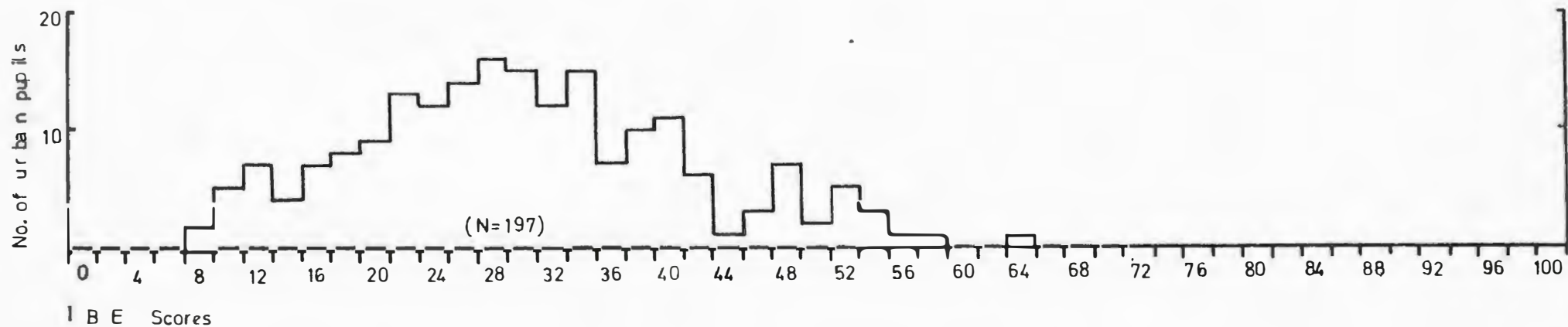


FIGURE 6.5 HISTOGRAMS SHOWING DISTRIBUTION OF IBE SCORES FOR URBAN AND RURAL SUB-GROUPS

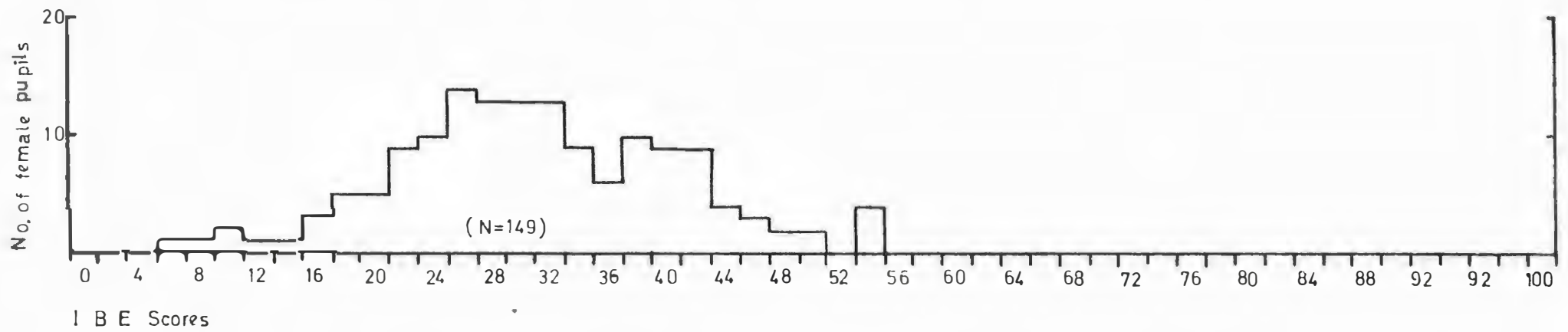
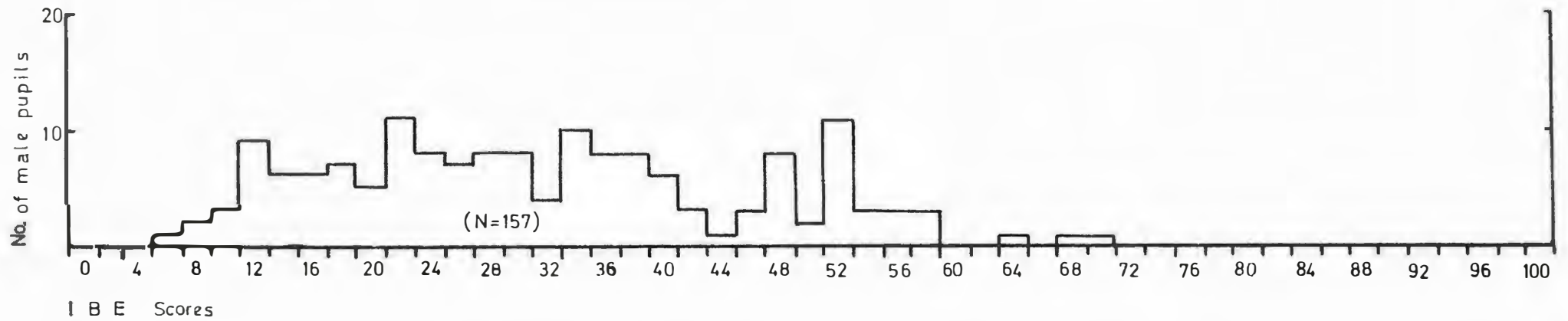


FIGURE 6.6 HISTOGRAMS SHOWING DISTRIBUTION OF IBE SCORES FOR MALE AND FEMALE SUB-GROUPS

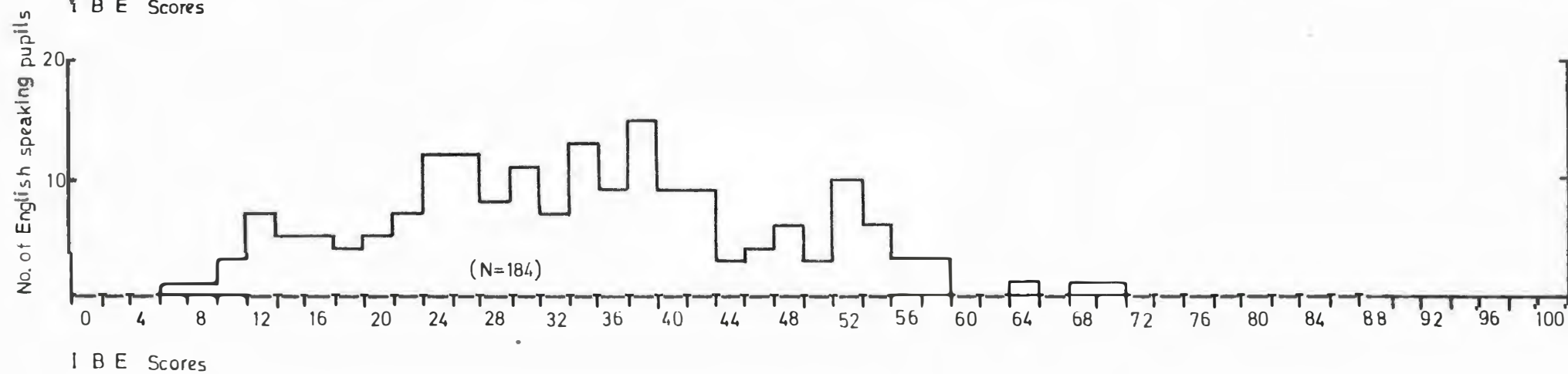
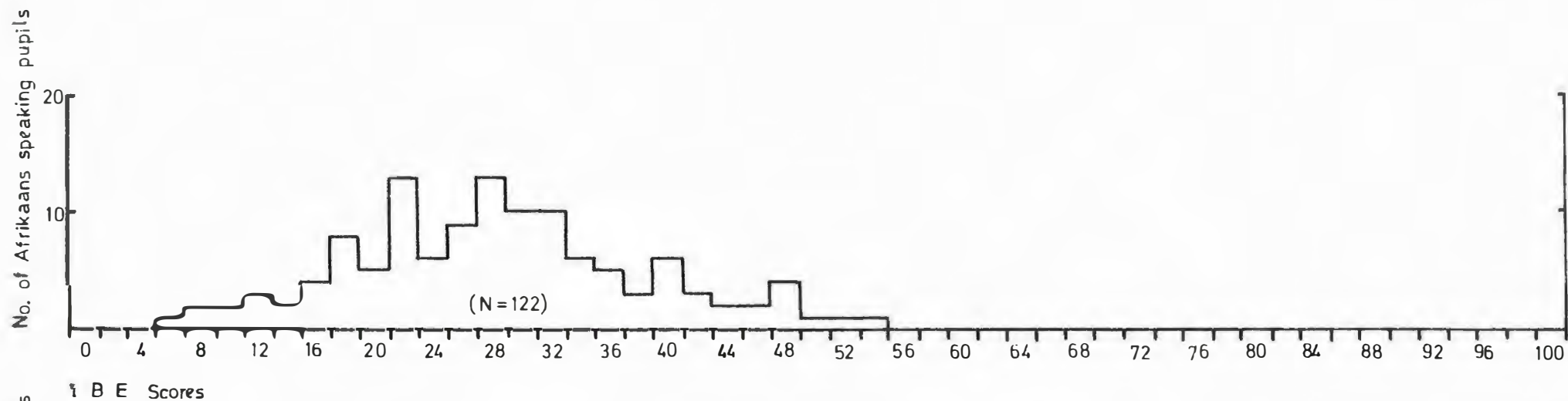


FIGURE 6.7 HISTOGRAMS SHOWING DISTRIBUTION OF IBE SCORES FOR AFRIKAANS AND ENGLISH SPEAKING SUB-GROUPS

Considerable variation exists between the IBE scores recorded by the different sub-cultural groups. Rural, male and English speaking pupils reflect a conservationally more privileged background than do their sub-group counterparts. As with the CAWT scores, a partial explanation of the differences lies in the influence of agriculture pupils and private schools. The scores of the 17 agriculture pupils, at 24,98% above average, inflate the results of all three sub-groups. If these 17 were deleted from the sample the rural score would drop from 34,33% to 33,36%. If both farmer's children in rural areas and agriculture pupils were excluded from the sample the rural figure would drop further to 31,36% — only slightly above the urban result. When a further subtraction is made for the built-in advantage of the rural sub-group in questions A4 and A5 the figure becomes 30,21%, almost at parity with its urban counterpart (30,13%). Despite these compensating tactics however, the fact remains that rural pupils appear to be significantly more privileged than urban pupils, as farmer's children and pupils studying agriculture are an integral part of the rural scene.

The effect of deleting the agricultural pupils from the male and English scores results in figures of 31,07% and 33,10% respectively. Thus overall, males would effectively fall slightly below females, although as can be seen in the language-sex combinations, there are substantial differences within this average picture. Overall, the English speaking score would be only slightly deflated.

A more important reason for the difference between Afrikaans and English speaking pupils' results lies in the loading effect of private schools, which is shown for standard and selected grouping in Table 6.29 (comparable in format to Table 5.20 on p.117). If the inflationary effect of both agriculture pupils and private schools is removed from the English figure, it resolves at 32,05%, which is still 3,54% above that for the Afrikaans speaking sub-group. It would thus appear that as a sub-group English speaking pupils are more privileged in terms of conservation-orientated background, a point which will be pursued in the next chapter. Tentatively it is concluded that having deleted disadvantageous factors extant in the structure and application of the survey, and recognising that some non-evident cultural bias may exist, the differences between the Afrikaans and English speaking scores is probably a result of

TABLE 6.29 RESULTS OF THE IBE BY STANDARD AND SELECTED GROUPING FOR PROVINCIAL SCHOOLS ONLY

	TOTAL	U	R	♂	♀	A	E	m	f	M	F
AVERAGE % (m)	30,67	28,72	33,68	29,65	31,66	28,51	32,64	26,24	30,14	31,97	33,52
n	255	155	100	126	129	122	133	51	71	75	58
EFFECT OF PRIVATE SCHOOLS*	+0,96 %	+1,41 %	+0,65 %	+2,33 %	-0,42 %	N/A	+1,05 %	N/A	N/A	+2,78 %	-1,26 %

\* + = inflating influence on score  
 - = deflating influence on score

N = 255

different cultural values operative in the pupils' upbringing and development.

Further scrutiny of Table 6.29 indicates the uneven influence of the three private schools. The one girls' school depressed the results, while the two boys' schools inflated them. While one may cautiously suggest that pupils in private schools may be slightly more privileged in IBE terms, further surveys embracing larger numbers of schools may show this not to be the case. The question of private schools themselves having anything to do with the result is an open one. Analysis of the responses to questions A7, A10 and A11 show that in these respects, the pupils of private schools are no better off than those in provincial schools. Where pupils of private schools do score slightly higher however, is in the number of conserved areas visited, books and magazine readership and hobbies. It is of note too that these pupils have proportionately slightly more parents in the professional occupations than do their provincial school counterparts. Referring to Table 6.3 (p.130), the professional parents' percentage for English speaking pupils drops from 20,65% to 19,55% for fathers, and from 32,06% to 30,06% for mothers, if private schools are excluded from the count.

#### 6.4 Test reliability

The split-half coefficient of reliability was applied to the scores composing the IBE in the same way in which it was done for the CAWT. The Product Moment coefficient of correlation,  $r_{xy}$ , worked out at 0,9976 so that  $r_{\frac{1}{2}\frac{1}{2}} = 0,9987$ , indicating very high internal reliability. It will be recalled however that following the point established in section 4.5 high reliability is not in itself a guarantee of high validity.

#### 6.5 Preliminary conclusion

The value of Section A lies as much in the methodological problems which it has unfolded as in the results which it has produced.

As in the case of the CAWT, the results of the sample as a whole can be viewed with a reasonable degree of confidence as being a broad reflection of the target group's interest and activities. Results relating to subgroups must however be viewed with a substantial degree of circumspection, and possibly as no more than indications of trends for further investigation. In summary of the individual questions which have been analysed, a number of general points and trends germinal to any further investigation emerge:

- a. The clearest is possibly the relationship of conservation awareness, as measured by the CAWT, to active involvement and participation in conservation-orientated activities such as those expressed in questions A6, A7, A8 and A13. The relationship appears to be enhanced by the frequency of experiences coupled to variety, but for repetition of the same or similar activity there are no clear results.
- b. The potential role waiting to be filled or exploited by the teacher, school situation and private organisations.
- c. The positive role which can be played by parental involvement, however peripheral. While it is true that the broader sphere of parental interest and family atmosphere is missing from the survey, and indeed is extremely difficult to determine, the matter has been briefly touched on at various points, most notably question A10. Following generally operative tenets, parents are probably in the long run the major factor which can lead to or allow other factors to operate. It might be borne in mind too, taking Table 6.4 (p.131) into account, that not only are financial considerations arising from occupation a factor, but within White society in South Africa value systems linked to occupational status and position are likely to play at least an equal, and probably a more important, role.

The survey neither sought nor provided evidence on how the incorporation of environmental and conservation education into school curricula could be achieved. The potential effect is however raised by the results of question A3 which in a small way provides grist for the mill of the protagonists of the cause. It should not however be viewed out of perspective as there are many other variables relating to school curricula

which have neither been examined here nor can be deduced from the results. It is certainly an area in which a further more detailed study would be rewarding.

A general evaluation of the IBE in relation to CAWT scores is carried out in Chapter 7, but a few specific points, in addition to those made in section 6.1, are appropriate here. Clarity gained from hindsight suggests that there are two important areas of omission which might be considered for any future application of the exercise. These are the matter of peer group influence and the wider provision of open-ended responses to allow for the fuller expression of pupils' own views, the value of this being amply demonstrated in the CAWT. A great deal of further work is also required to determine value relationships both within and between questions. Are books, for example, 'equal' to teachers and how does a three day visit to a conserved area compare with three days on a structured conservation awareness course?

Possibly the most valuable conclusion to be derived from Section A is the justification and indeed the need, for a computerised multi-variate analysis of this type of data. With the insights gained about the inability of 17 year olds to handle complex questions and provide relevant data (see also Chapter 8), it is clear that structuring of a questionnaire and questions in relation to each other must appear to be on the most simple and unambiguous level, while at the same time allowing for the complete integration and inter-relation of responses into meaningful compounds and relationships. The problem must be faced that pupils in the target group have little or no experience of answering questionnaires and responding to unprepared questions. In order to obtain both accurate and complete data, it is suggested that a reassessment of the time question should be a high priority for consideration. As has been pointed out there are several aspects of this survey in which the rigid time constraints acted detrimentally.

In sum total Section A is considered to have been a worthwhile undertaking, not only for what it has produced, but also for highlighting aspects of the problem worthy of future investigation. As an experimental survey in the field it has achieved its purpose. We now turn to the relationship between the achieved Index of Background Experience and the Conservation Awareness Test.



CHAPTER 7 THE RELATIONSHIP OF THE CONSERVATION AWARENESS TEST TO THE  
INDEX OF BACKGROUND EXPERIENCE

The purpose of this brief chapter is to consider the validity of one of the major hypotheses of the survey i.e. that there would be a clear relationship between pupils' experience in environmental and conservation terms and their measured level of conservation awareness (refer to section 1.4). The relationship between the CAWT and individual types of pupil experience has been covered in detail in Chapter 6, and attention is now directed towards comparing the results of the CAWT with those of the IBE. This may be conducted at two levels: by reference to material already presented and by a statistical correlation analysis.

7.1 Comparison of visual data presented in Chapters 5 and 6

Initial comparisons may be made by comparing the following tables and diagrams which have been constructed to facilitate this:

Table 5.17 (p.110) with Table 6.27 (p.175) — Results by standard and selected groupings for the whole sample.

Table 5.18 (p.111) with Table 6.28 (p.176) — Results by basic groupings for the whole sample.

Table 5.20 (p.117) with Table 6.29 (p.182) — Results by standard and selected groupings for provincial schools only.

Figure 5.1 (p.112) with Figure 6.4 (p.177) — Distribution of scores for total sample.

Figure 5.2 (p.113) with Figure 6.5 (p.178) — Distribution of scores for urban and rural sub-groups.

Figure 5.3 (p.114) with Figure 6.6 (p.179) — Distribution of scores for male and female sub-groups.

Figure 5.4 (p.115) with Figure 6.7 (p.180) — Distribution of scores for Afrikaans and English speaking sub-groups.

Reference to these figures show that the major contrasts are clearly the different distribution patterns of the scores achieved by pupils.

Proportionately more high scores were achieved in the CAWT than for the IBE, resulting in the respectively negative and positive skewing of the response patterns. Composite graphic comparisons of the six tables listed above are shown in Figures 7.1 to 7.3. Apart from amplifying the points made above, the graphs suggest a fairly consistent relationship between

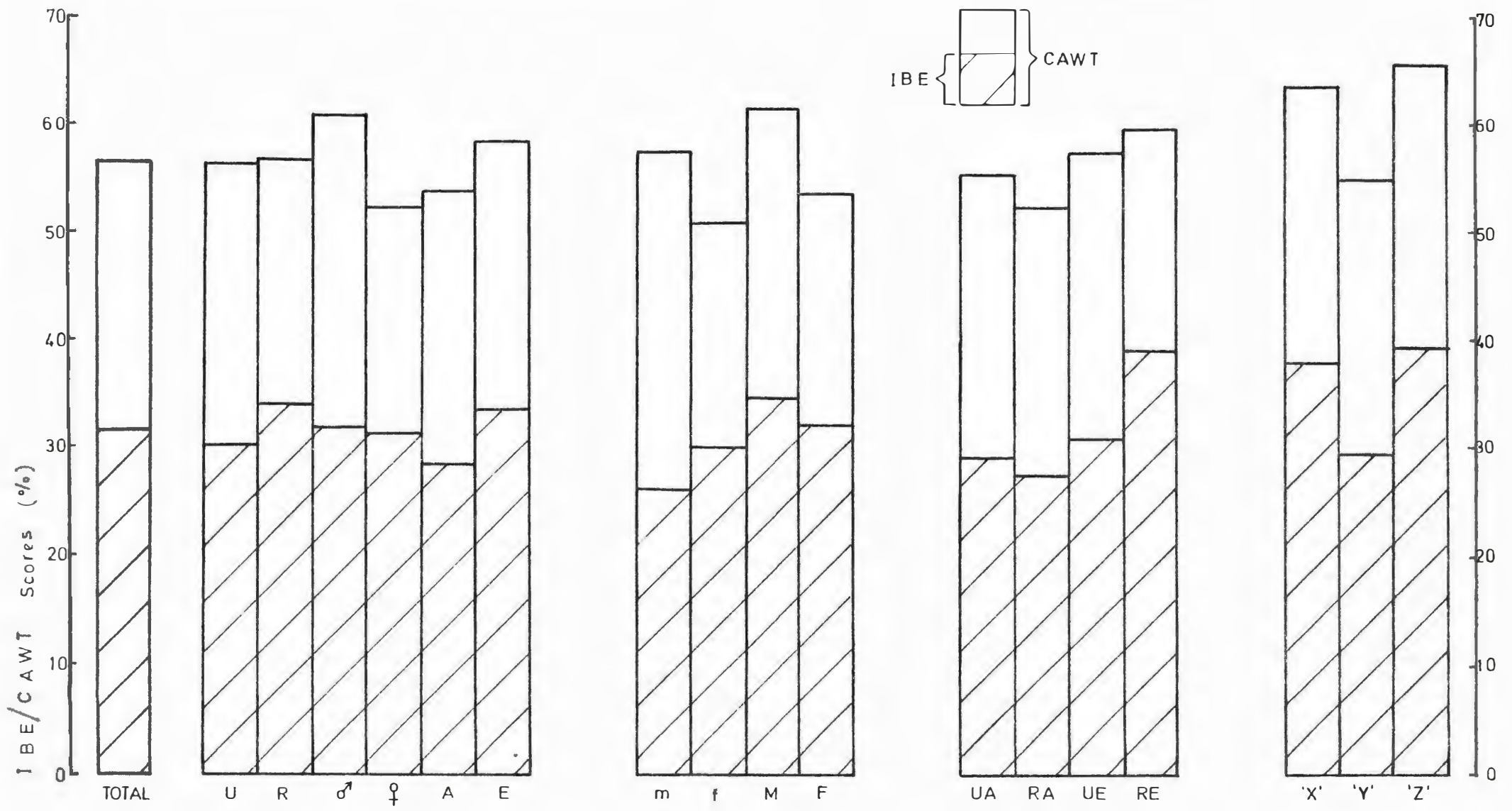


FIGURE 7.1 BAR-GRAPH SHOWING COMPARATIVE RESULTS OF CAWT AND IBE AVERAGES BY STANDARD AND SELECTED GROUPING FOR THE TOTAL SAMPLE

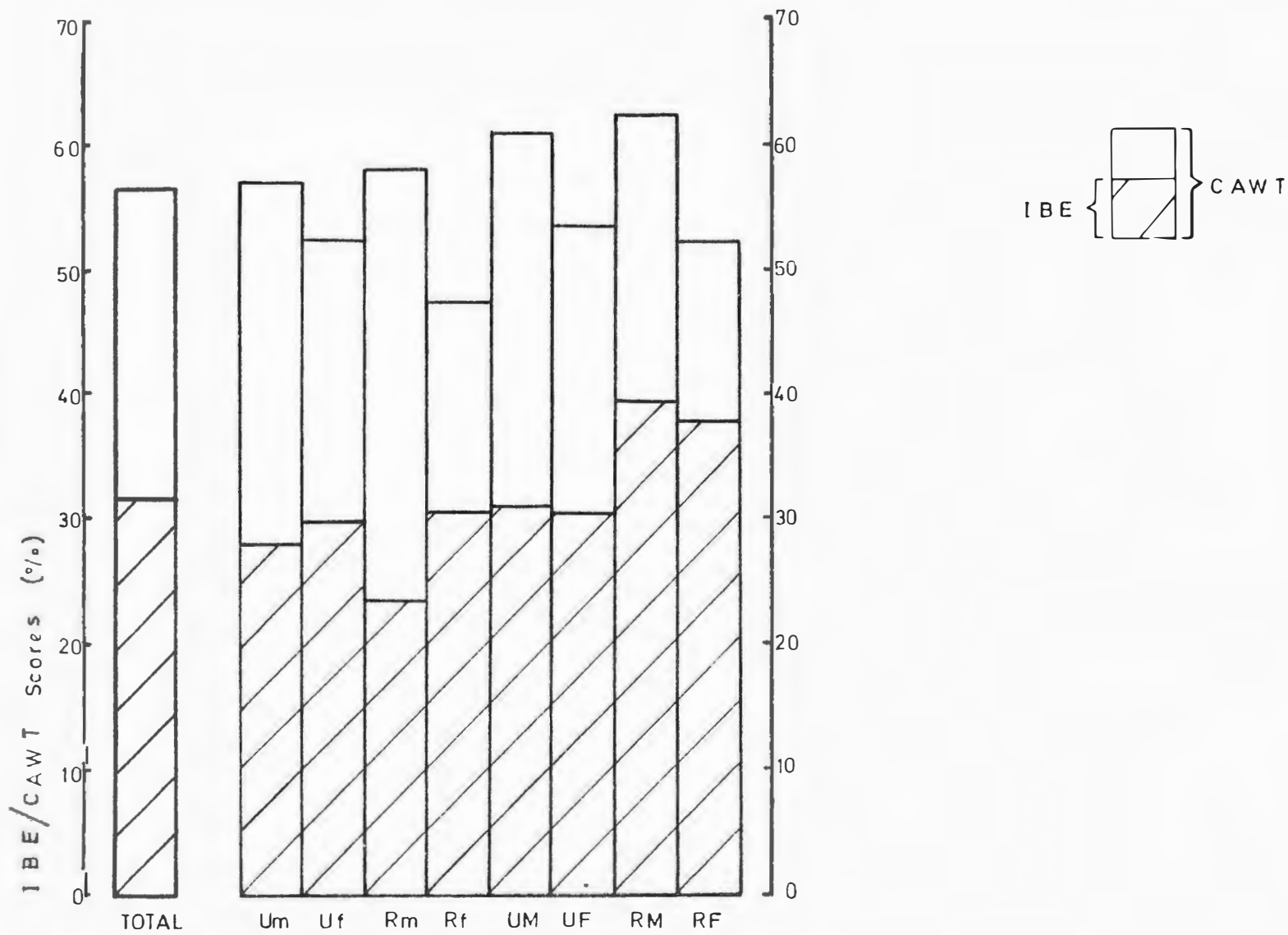


FIGURE 7.2 BAR-GRAPH SHOWING COMPARATIVE RESULTS OF CAWT AND IBE AVERAGES BY BASIC GROUPING FOR THE WHOLE SAMPLE

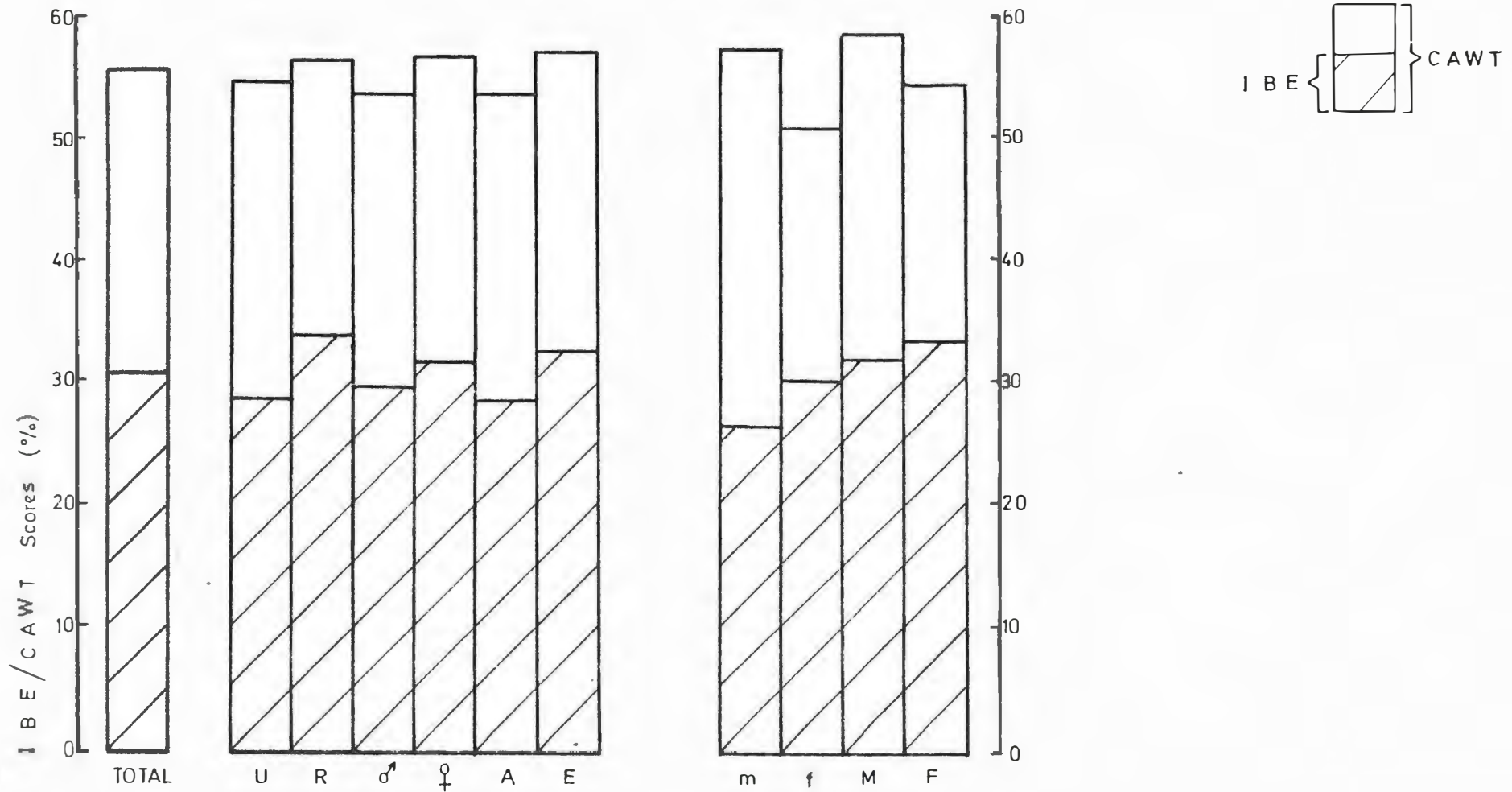


FIGURE 7.3 BAR-GRAPH SHOWING COMPARATIVE RESULTS OF CAWT AND IBE AVERAGES BY STANDARD AND SELECTED GROUPING FOR PROVINCIAL SCHOOLS ONLY

the CAWT and IBE results, but this is deceptive. The averages upon which these diagrams are based shroud inconsistencies to be found in a comparison of the scores of individual pupils, a factor which can only be taken account of by a statistical correlation.

## 7.2 Statistical correlation

The Product Moment coefficient of correlation ( $r_{xy}$ ) was considered the most suitable for the levels of measurement, i.e. interval and ratio scale, with which we are concerned. The correlation is obtained from the expression

$$r_{xy} = \frac{\sum xy}{\sqrt{\sum x^2 \cdot \sum y^2}}$$

where x is the deviation of each individual pupil's CAWT score from the mean of the particular grouping or total, and y is the deviation of each similar raw score from the means of the IBE grouping or total. The normal method of calculation was followed and the results for the total sample, standard, basic and selected groupings, are shown in Table 7.1. They are characterised by two features: the fact that  $r_{xy}$  is low overall (0,22 for the total sample) and by the very wide variation within the total sample i.e. between sub-groups.

Although correlation coefficients are not indicators of causality, they do reflect the strength and interdependence of a relationship, in this case the CAWT and IBE. As the correlation is in this case low, the overall relationship is a tenuous one. The situation is however substantially modified by two factors: the inner variability of the correlation coefficient, and the positive relationship between the CAWT scores and several of the individual questions constituting the IBE. The latter point has already been covered and attention is now focused on the former.

Variation of the correlation coefficient among the various sub-groupings comprising the IBE ranges from +0,46 for urban Afrikaans speaking males, to -0,38 for rural English speaking females, thus indicating that the experiential factors viewed as a group, i.e. the IBE, have a varying influence upon conservation awareness, depending upon such interacting

TABLE 7.1 CORRELATION COEFFICIENTS ( $r_{xy}$ ) OF THE CAWT AND IBE FOR STANDARD, SELECTED AND BASIC GROUPINGS

SUB-GROUP	$r_{xy}$	n
U	0,26	197
R	0,20	109
♂	0,38	157
♀	0,02	149
A	0,26	122
E	0,19	184
Um	0,46	31
Uf	0,06	46
Rm	0,45	20
Rf	0,05	25
UM	0,38	60
UF	0,08	60
RM	0,29	46
RF	-0,38	18
m	0,45	51
f	0,06	71
M	0,34	106
F	-0,02	78
UA	0,26	77
RA	0,27	45
UE	0,23	120
RE	0,10	64
Farmer's children	0,18	49
Pupils who have lived abroad	0,23	29
Pupils studying agriculture	0,20	17
Total sample	0,22	306

variables as language group, sex and school. This allows the logical deduction that similar operative conditions will apply to the component parts of the IBE, thus greatly increasing the complexity of the matrix of interrelationships. Evidence is provided by a correlation analysis based on schools, language group and sex of pupils, the results of which are shown in Table 7.2. In this case variation of  $r_{xy}$  ranges from a high +0,80 (Afrikaans speaking males) to a substantially negative -0,40 (English speaking females).

TABLE 7.2 CORRELATION COEFFICIENTS ( $r_{xy}$ ) OF  
THE CAWT AND IBE BASED ON SCHOOL,  
LANGUAGE GROUP AND SEX OF PUPILS

SCHOOL NUMBER	LANGUAGE GROUP, SEX	$r_{xy}$
1	m	0,59
	f	0,47
2	m	-0,03
	f	-0,19
3	m	0,87
	f	0,06
4	m	0,80
	f	-0,08
	M	0,35
	F	-0,40
5	m	0,00
	f	0,11
6	M	0,23
	F	-0,39
7	M	0,21
8	M	0,03
9	M	0,67
10	F	0,00
11	F	0,10
12	M	0,59
13	F	0,26
14	M	0,46

Further examination of Tables 7.1 and 7.2 reveals that not only is  $r_{xy}$  generally more positive for males than females, but that all but one negative correlation refer to females. This raises the interesting possibility of the extent to which the different components of the IBE are biased towards male-orientated activities. While the information in Tables 6.6 (p.136) and 6.10 (p.147) suggest that female pupils tend to participate in the listed activities to a slightly lesser extent than males do. This is contradicted by the results in Table 6.7 (p.139) and would in any event not in itself account for the differences in  $r_{xy}$  values. Thus the very real possibility exists that while females are participating in the activities, the influence upon the recipients' level of conservation awareness is very much less than that for males; it frequently seems to have no bearing whatever.

It will be recalled from the examination of CAWT scores that females overall did not perform as well as males and that only by manipulation of a number of rationalising devices was it in fact possible to conclude a dubious verdict with respect to the  $H_0$ . As indicated at that point the picture now takes on a new meaning, inasfar as females may not have scored as high as males because the teaching and learning experiences to which they had been exposed were not always appropriate to their particular needs and circumstances — these in turn not necessarily being the same for Afrikaans and English speaking females. The unanswered question is however why, if this is in fact so, did they score as well as they did in the CAWT? What, may be asked, are the factors which would give a high correlation between conservation awareness and experiences for females? While the present survey has exposed the problem, it has only tentatively begun to provide the answers to issues such as these.

A further aspect arising from the two tables are the tendencies, albeit slight, for Afrikaans and urban pupils to have higher and more positive  $r_{xy}$  values, although within both sub-groups there is a wide range. Also following up a point made in the previous chapter, there is no evidence to suggest any correlation between the higher average CAWT scores and higher IBE rating of English speaking pupils. This in turn implies that their slightly privileged position in terms of experiences is not necessarily translated into greater awareness, although it may occur for individuals within the group. It is worth noting however that the correlation for the private schools (the last three listed in Table 7.2) is, at approximately 0,45, significantly above the average. All are boarding schools and the results suggest that for an undetermined proportion of the pupils there, there is a relatively strong link between conservation awareness and experiences. In the same light it is also of interest that  $r_{xy}$  is lowest in the case of the girls' school. Likewise attention might again be drawn to a comparison of the influence of private schools on the scores of the CAWT and the IBE. As indicated by a comparison of Tables 5.20(p.117) and 6.29 (p.182) there is a considerable degree of concurrence, particularly insofar as the influence is positive or negative. Because of the small number of schools involved this aspect should not however be overemphasised.



### 7.3 Conclusion

Returning to the low overall coefficient of correlation; while the result might at first glance appear to fly in the face of some of the most fundamental principles and premises of educational psychology, in the light of what has been said, this is not necessarily so. What has been shown is that as far as conservation education and awareness are concerned, the relationship to experiences is not a linear one, but subject to variety of influences, many of which are not yet clearly understood.

The reasons for the low correlation lie in two integrated sets of factors. The relationship between different parts of the IBE (in practice, the questions asked) to the CAWT vary both in themselves and in relation to outside influences such as language, sex and school. This does not in any way diminish the value of the CAWT or the component parts of the IBE seen in relation to the CAWT. Nor does it devalue the intrinsic worth of the individual questions. What it does bring into question is the present grouping of components of the IBE as a reliable device for predicting and developing conservation awareness. It re-opens the question of the component values in relation to each other and their fairness to all sub-cultural groups within the sample. This is not to suggest that the quest for an Index of Background Experience with a high correlation to conservation awareness should be abandoned, but rather that further experimentation is needed, taking into account the knowledge which has now been gained and the faults which have been exposed.

In conclusion, consideration of the results show that the IBE may or may not be linked to the achieved level of conservation awareness, this being dependent upon a number of variables such as language group, sex and school location, as well as factors intrinsic to the composition of the IBE. The hypothesis on this relationship must therefore be conditionally rejected pending further investigation.

## CHAPTER 8 PUPIL PERCEPTION OF CONSERVATION ISSUES

This chapter is concerned with two areas of interest complementary to the main thrust of the research: the raison d'être for conservation and the thorny issue of commitment, both seen through the eyes of the pupils. Encompassed within these areas are several related issues, such as perceived problems of, and personal benefits accruing from environmental conservation, contradictory values held on the subject and expressed values of optimism and pessimism.

The results of Sections C and D of the questionnaire form the empirical evidence upon which this chapter is based. Although these two sections were initially seen as covering slightly different areas, insights gained from the research increasingly blurred the intended distinction as outlined in Chapter 4, so that they are now regarded as covering overlapping areas of concern and are accordingly dealt with in an integrated manner. It is furthermore appropriate at this point, before embarking upon matters largely connected with perception, to expand briefly upon the operational definition accepted in Chapter 1 (Saveland, 1976b) and to draw attention to a number of workers who have either contributed to or have a current interest in the understanding and development of environmental perception.

### 8.1 Environmental perception

Like all perceptual processes, environmental perception plays a dual role in our lives. It is the source of our phenomenal experience in the world and it provides us with a guide to action in the environment. As a concept it has evolved over the last two decades from more generalised views of perception (Viljoen, 1981).

Bruner (1957, p.46) had, for example, advanced a general theoretical view of perception as depending upon "the construction of a set of organised categories in terms of which stimulus inputs may be sorted, given identity, and given more elaborated, connotative meaning", thus delineating it as an act of categorisation closely linked to environment in the broadest sense. Other early contributions from psychologists include the work of Vernon (1962), Gibson (1968, 1970) and Lloyd (1972), while Kirk (1963)

and Strauss (1969) were among the first to relate perception studies to geography. Kameron (1973) was concerned with the way in which individuals perceived the natural world at large, while Schafer (1969) investigated the role of individual values concerning small semi-natural areas, most notably campsite preferences.

By the early seventies Stea and Blaut (1970, 1973) and Blaut and Stea (1971, 1974) were pointing out that "'environmental learning' deals with comprehension of different environments on a different scale from that usually dealt with in psychological research on perception." (Quoted from Marsden, 1976, p.132). Their research had led to conclusions on the early cognitive mapping ability of children, which were to some extent in conflict with well known developmental theories of learning, such as Piaget's (1966, 1975), whose developmental stages, although not fixed to the chronological or mental age, are invariant in sequence. There was likewise a conflict with Bruner's (1960) sequential systems of representation, Stea and Blaut (1973) blending his enactive and iconic systems.

Relating these findings to the functional relevance of environmental perception, Ittleson et al. (1974, p.123), who offer one of the most comprehensive coverages on the topic, describe it as providing us with

"... information about the systematic relationships among the components of our world, and it is the means whereby we can relate our own goal striving to the environment in which we live. Environmental perception thus orders our world, with ourselves as part of the ordering process. In this sense, the environment can be said to exist for us only in relation to the ways in which it is significant to us."

This view of environmental perception, as primarily an information processing operation, is widely supported in outline, though not necessarily all details, most notably by workers in disciplines other than psychology such as Gibson (1966), Haber (1969), Goodey (1975, 1976, 1977a, 1977b) and Pick and Beer (1978).

Marsden (1976, p.61) in arguing the need to link real and perceived environments, emphasises a systems approach in which behavioural studies form a part: "We have to consider 'things' (linked by flows of matter and energy) and 'images of things' (linked by flows of information)." Placed in an environmental context, he provides a link between Stoddart

(1965, p.243), who somewhat simplistically viewed the ecosystem concept as bringing together "environment, man and the plant and animal worlds within a single framework within which the interaction between the components can be analysed", and Haggett (1979) who sees environmental perception as concerned with the structure and interaction of two major systems: the ecological system that links man and his environment, and the spatial system which links regions in a complex interchange of energy flows. It is extremely important in this context however, not to overlook the multi-faceted nature of man's relationship to the environment and to the factors which determine differences in individual response; in the Western cultural tradition, "parameters such as aesthetic discrimination, status concern, personality factors and ecological need." (Ittelson et al., 1974, p.337). More recently Viljoen (1980, p.98) has proposed a new environmental model of man with a shift of emphasis from what he terms "the traditional structural to a transactional view of perception."

In similar vein Sandford (1972, p.83), had issued a word of caution which is no less true of environmental studies today. "Our knowledge of the physical and physiological aspects of perception is considerable, but much less is known of the psychological aspects and still less is known about perception when applied to specific problems in learning geography", a view echoed by Goodey (1976) and Carrick (1978). Goodey (1976, p.63) invokes Saarinen's (1969) dictum that:

"In spite of this promising growth and apparent utility the state of the art [environmental perception] could most accurately be described as still in its infancy."

Carrick (1978, p.5) amplifies this viewpoint with his plea for perception studies in environmental education. In setting out a model for image studies applicable to "almost every man/environment related context", he draws attention to the fact that although geographers have long since recognised the importance of perceptual processes which affect man's relationship with his environment, very little understanding of this has permeated down from tertiary level studies. One may think for example of Imperator's (1970) work linking environmental perception and meaningful learning to concept formation in the natural environment, and of Cole (1973) who drew attention to the importance of perception in environmental decision making, one of the areas of perception research currently being pursued by UNESCO as part of their 'Man and Biosphere' programme.

In synthesising the concept of environmental perception, one may begin with Rillo's (1971, p.40) equation of perception with awareness of the elements of the physical environment through the senses:

"Many kinds of perception are utilised: the senses of touch, smell, hearing, sight, gravity and balance, the visual sensations of color, shape, rhythm, and motion are all biological techniques of orientation to the environment."

To these considerations may be added the role of the needs, values and emotions in developing an individual's mental image of the world, and the fact that what we perceive filters to the mind through a cultural screen (Saveland, 1976b). Thus we are confronted with the central issue of man's relationship to the environment; his behaviour towards it with all that this implies in terms of needs, desires, learning, education and the resulting ethical stance.

## 8.2 Development and design of questions

Following upon Chapter 4, in which the format of the questionnaire was outlined, the specific aims of Section C were to elicit from pupils their:

- a. Perceptions of themselves and others in relation to nature conservation.
- b. Opinions on why there should be conservation at all.
- c. Opinions on selected problem areas.

Built into this, and following upon the work of Maloney et al. (1975) referred to in Chapter 1, was an attempt to assess to what extent contradictory values were held between verbal and actual commitment.

The specific aims of Section D were to:

- a. Obtain pupils' opinions relating to physical problems in the environment, including their perceived seriousness or otherwise, both in a South African and an international context.
- b. Gain an idea of the degree of optimism or pessimism with which the future in environmental and conservation terms, was viewed by the sample group.

For reasons explained earlier neither of these sections was intended to be scored in the way in which Sections A and B were. Where relevant the rationale for the design and inclusion of individual questions is dealt

with under discussion of the question concerned. It is important to note however that notwithstanding their intrinsic value, individual questions were also designed as parts of groups of questions aimed at eliciting certain patterns of responses, while some, such as question D4, had the additional function of providing data comparable with results found in other studies. Attention is also drawn to the reasons for the scrambling of questions, covered in Chapter 4.

Finally it is pertinent to emphasise at this point that, as with much else in the research programme, the aims and the steps taken towards achieving them, were both tentative and experimental. They are neither comprehensive in coverage nor definitive in method, but are seen rather as testing direction for further research in the future.

### 8.3 'Why conserve wildlife?'

The measurement of attitudes on this topic was conducted in two ways: by an objective and knowledge-based approach, and by eliciting perceived personal benefits derived from or likely to be derived from wildlife conservation.

#### 8.3.1 Objective reasons

This section consisted of two questions, C17 and C18. Question C17, "List what you would consider to be South Africa's 5 most important natural resources." (AVI: "Keep your answers to one word or a short phrase.") was indirect, while question C18 went straight to the point: "Write down what you would consider good reasons why a portion of our country should be retained for game reserves, nature reserves and wild areas."

Wildlife, in the broad sense including all non-domesticated plants and animals and their habitat (and thus for practical purposes being synonymous with the idea of 'nature'), is today widely regarded as a renewable natural resource (UNEP, 1976; IUCN, 1978, 1980; WLSSA, 1980). The purpose of question C17 was to ascertain what proportion of the target

group might see it as such. In Natal the concept of 'natural resources' is explicitly covered in the standard nine geography syllabus, but it receives only indirect and implicit consideration in the fourth phase agriculture and biology syllabi. It is likely to have been taught in the second and third phases, but nowhere is specific mention made of wildlife in this context. It is worth noting that when faced with the question no fewer than 18 pupils in seven different schools, asked what was meant by the term. No explanation was given and the question was attempted by only 268 pupils (87,57% of the sample).

It is debatable as to whether wildlife/nature might be regarded as one of South Africa's five most important natural resources. It is however a reasonable viewpoint considering the country's exceptional species diversity as well as economic, recreational and scientific benefits accruing from the utilization and exploitation of natural resources. The only other natural resources which, in the considered opinion of the researcher, can be placed among the five are minerals (non-renewable), soil, water, grazing, forests and fishing, all but the first of which may be construed to some degree as a wildlife harvest.

The results of the question, from the point of view of whether wildlife was included, are shown in Table 8.1. Although 29,10% of those answering (25,49% of the sample) clearly included the idea of wildlife, this figure is open to some question. The frequent appearance of the words 'wildlife', 'nature', 'wild' and 'natuur' in the first or second position among the answers suggests that the general spirit of the questionnaire had been comprehended by this stage and that responses had an empathetic loading. The probability must also be allowed that what was understood by these terms was not necessarily the meaning attributed to them in this research, but the more common misconception of large or spectacular animals. Results were also characterised by the differences between schools; five were not included in the 29,10%.

In the sub-group breakdown there are striking differences between urban/rural and Afrikaans/English attitudes. The greater rural figure is understandable, if somewhat surprising in magnitude, but the size of the Afrikaans/English difference can only partly be accounted for by the rural

English loading effect discussed in Chapter 5. A large but undetermined proportion of the disparity must be due to real differences of opinion, quite possibly rooted in historical and cultural factors.

TABLE 8.1    RESPONSES TO QUESTION C17 BY STANDARD GROUPING (%N/n)

RESPONSE	TOTAL	U	R	♂	♀	A	E	n
Wildlife included	29,10	22,35	40,82	28,68	29,55	15,52	39,47	78
Wildlife excluded	70,90	77,65	59,18	71,32	70,45	84,48	60,53	190
n	268	167	101	142	126	103	165	

N = 268

Among the other 70,90% of pupils who responded to the question, the most common answers were gold, diamonds and coal. Only 12 of the 190 mentioned agricultural crops, five mentioned clean air or clean water and only eight mentioned South Africa's soil (seven being from one school!).

Question C18, although direct, was not an easy one for pupils to answer and some time may justifiably be spent outlining the ambient framework within which answers would have to fall. The question, with minor variations, is one which is constantly being asked of conservationists; expectedly by those unaware of the principles upon which conservation is based and most forcefully by developers and economists who often see their profits and projected growth rates to be threatened by what appears to them to be purely sentimentalist attitudes. The fact that calls for environmental conservation, more conserved areas or an ecological approach to environmental problems do often present a threat to these aims is beyond doubt. Chiappo (1980, p.8) has good cause to recall Bosquet's observation that ecologists

"... are often so far from understanding the full sub-versiveness of their findings and calculations that they never cease to be astonished at the bad faith and hostility with which they are received by bankers and industrialists."

The issue becomes particularly acute when there is either a perceived or a real shortage of land 'suitable' for development of industry, housing,



freeways etc., while large or even small key areas appear to lie 'sterile' and 'underutilized' as nature reserves; or when a conserved area is known to or thought to contain a natural resource with potentially high short term gains, such as the coking coal deposits of Kruger National Park.

Turning to the rural situation, public pressure against the withholding of tracts of countryside, no matter how small, for what are perceived to be the benefit of wildlife as opposed to humans, is often very strong, particularly where high population density is coupled with poor farming methods and low productivity as in several of South Africa's homeland areas. The situation may be further aggravated by the conserved area being perceived to be the 'best' land, which, entirely due to better management, it usually is in relation to its surroundings. The game reserves of KwaZulu to a large extent fit into the situation described, but the matter is by no means confined to rural peasants or Blacks. Wealthy White farmers in southern Natal, who should know better, have regularly clamoured for the steep Drakensberg foothills to be opened up for 'more productive use' i.e. grazing, despite the potentially disastrous ecological and long term economic consequences of this action.

Stripped of irrationality and sentiment, all arguments for conservation, and particularly for the existence of conserved areas, may be reduced to four areas of justification: economic, scientific, recreational and aesthetic (which embraces emotional, spiritual and cultural components), (Chiappo, 1980; IUCN, 1980; WLSSA, 1980b; Womersley, 1980). These reasons vary in their cogency and validity with time and place, but all are reflected in the growing world concern with realconserve referred to in Chapter 2. While it is not our purpose to examine them in detail, we may profitably make mention, and dispose of, three other reasons often given in lieu of or in conjunction with them. These are expressed as 'education', 'for future generations' and as a vague notion of 'for our own survival'.

None of these reasons have a convincing basis of support. Education is a function deriving from a carefully reasoned need to conserve and the existence of conserved areas, rather than a justification in itself. It is sometimes argued that the educational aspect is fundamental to all other factors, and while there is undoubtedly a case to be made for this

view, one must nevertheless be aware, as implied in Chapter 3, not only of the clichéd use of the term, but its occasional appropriation by both esoteric and nefarious causes in order to enhance their apparent validity. What is actually meant by 'education' in these contexts presents a problem with which we are all too familiar. As far as the 'future generations' and 'survival' arguments are concerned, however much validity they may have for those fortunate enough to be able to enjoy and benefit from conserved areas, they carry little weight with the majority of the world's, South Africa's and Natal's population, whose existence is overwhelmingly concerned with surviving from one day to the next. As Fensham (1976b) observes, for environmental education to be at all meaningful in the long run it must "deal with the fact that two thirds of the world's population has not yet experienced that quality of life the excess and abuse of which threatens its continuity for those who have known it." (Quoted in Womersley, 1980, p.35).

The question was answered by 287 pupils, although not one clearly articulated all four or even three of the reasons listed as valid; 12 pupils (4,18%) listed two of the reasons and 89 (31,01%) could be described as having some inkling of a single reason. These ranged from 'holidays' (66) through 'tourist attraction' (22) to 'creating job opportunities' (1). 49 pupils (17,07%) said conserved areas were of educational value and, despite what has been said about education as a reason, it is gratifying that one-sixth of the sample saw them as having this use. 154 answers (46,34%) were simply 'to conserve wildlife' or 'preserve our heritage' without any further elaboration, while 54 (18,82%) referred in some form to 'future generations'. A further variety of answers ranged from the 19 pupils (6,62%) who saw the role of conserved areas as a brake on development to seven (2,44%) who misconstrued them to be associated with pollution control.

In summing up the results of questions C17 and C18, the overall state of knowledge on the issue is poor and understandably, culture bound. It is quite clearly an area in which a major cross-cultural educational effort is required, the issue being important enough for it not to matter who undertakes it. It is in South Africa's interests that there is clear thought on the matter, by the public at large and not only by those engaged

in planning — physically or educationally. Our burgeoning population, multi-cultural society and the ignorance which the various sub-cultures have about each other and the wider world, make this a matter of urgency. Certainly for those who do believe that conserved areas are vital, or matter at all, dim notions of something good or personally beneficial about them will have to be replaced by logical, relevant and forceful arguments which are seen to be so, not only by a distant third world, but by South Africa's own third world.

### 8.3.2 Perceived personal benefits

Closely linked to the discussion above and the responses to question C18 are the perceived personal benefits accruing from the practice of conservation, particularly the existence of conserved areas, where it is most evident. It is reasonable to assume that, in general terms, a cause will be supported if the supporter benefits by the action, even when this benefit is indirect and amounts to no more than a good feeling, clear conscience or social approval. Pupils were however questioned on only one aspect of perceived benefits i.e. how they thought they felt, as this was considered to be most appropriate to their answering capabilities and experiences. No attempt was made to catalogue material benefits as these were felt to be largely inapplicable, although on occasions they were mentioned by the pupils.

Three questions, intended for close inter-analysis, were structured around this theme:

Question C3: Would you get any pleasure or thrill out of visiting wild or natural places?

Explain.

AVI: "If you've never visited such a place do not answer the question."

Question C19: When you go into a "wild" place where there are some wild animals (not necessarily dangerous) do you:

immediately feel part of it

take a little while to feel part of it

remain a little insecure throughout your stay

Do your feelings change after a few days?

How?

Question C23: How do you think you are ever likely to benefit from nature or wildlife conservation?

In the event however, the extent to which inter-analysis could take place was limited by the potentially high level of invalidity attaching to question C19.

Question C3 was answered by 305 pupils of whom 271 (88,85%) indicated YES, 12 (3,93%) NO and 22 (7,21%) NOT SURE. If the positive vote seems unduly high it might be borne in mind that according to the results of question A8 over 90% of the sample have in fact visited conserved areas and were, from that point of view, in a position to make a judgement. On the other hand, following Hunter (1970) studies on memory are consistent in showing that we all tend to recall those incidents which are most pleasant to us and repress those which are distasteful or unpleasant. Thus the pleasurable side of visiting conserved areas would tend to be remembered more than any unpleasant aspects such as boredom, fatigue, fear or insect pests. In the researcher's experience, visits to such areas also tend to be subject to subsequent embroidering and embellishment, particularly by the peer group, so that reality is displaced by socially accepted images of what such experiences are thought to be about. The strength of this assertion is amply demonstrated in the responses to question C19 where, pressed for further details, pupils' objectivity on the matter is shown virtually to disappear. Nevertheless the vast majority of the target group would probably enjoy visiting wild and natural places, subject presumably, in most cases, to not overdoing it. However in this analysis no attempt has been made to relate the issue to frequency or intensity.

Reference to Table 8.2 in which the explanations accompanying the structured responses are categorised show the dominant reasons for the YES answers to be grouped around two modes: personal pleasurable sensations of one kind or another and a sense of wonder and appreciation of nature's offerings. Of the 12 pupils who said NO, 10 expressed either lack of interest, boredom or a preference for city life. Among the 22 uncertain responses, 13 gave no reason, six said they had no experience upon which to judge and three said it depended upon where they went.

TABLE 8.2 CATEGORIZATION OF EXPLANATIONS ACCOMPANYING 'YES' RESPONSES TO QUESTION C3

n*	CATEGORIZED EXPLANATIONS
51	Pleasure of experiencing nature's beauty.
46	Pleasure of seeing animals and wildlife.
28	Nature lovers.
24	Learn about life's true values when exposed to the wonders of nature.
22	Need for solitude and peace.
22	Preferred the 'wild' to towns and cities for reasons ranging from pollution to upbringing.
19	Refreshing aspects of a change of environment.
10	Relaxation.
9	Thrill of being close to nature.
8	Religious reasons (close to God, creation).
2	Makes them feel creative.

\* 219 of the 271 pupils answering YES gave one reason, while 11 gave two reasons, giving a total of 241 reasons. 41 pupils gave no reasons.

N = 230

Pursuing the matter of personal feelings further in question C19, that question was responded to by 300 pupils of whom 162 (54,00%) said they immediately felt part of it; 123 (41,00%) said they took a while and 15 (5,00%) stated that they felt a little insecure throughout. The suspicions aroused by these results (on the basis of the researcher's experiences with pupils) were amplified by 103 out of the 162 in the first category then stating that they felt more secure after a few days. Four said they felt less secure, while 55 recorded no change. Amongst the 123 pupils who had stated that they would 'take a little while', 42 then recorded no change and of the 81 who did 19 said they became less secure. There is thus a large degree of confusion in the minds of over half the sample, either because of the question itself or concerning their own feelings on the matter, but nevertheless making the results of dubious value.

By way of testing the apparent invalidity of the results a small experiment

was conducted. 24 standard nine boys to whom access was available and who had recently been on a five day outing in the Drakensberg, were given the same question — with similar results. When the two teachers and the writer, who had accompanied them, rated each pupil on the same scale, major discrepancies appeared. Of the 21 pupils who had declared themselves to 'immediately feel part' only two were rated as such by the teachers, taking into account questions asked, nightly jockeying for sleeping positions surrounded by others and unwillingness to be alone. Nine of the 21 were rated as grossly insecure throughout the five day period. The result does not suggest that teachers are more accurate or objective in their assessments, but rather it verifies the indication that standard nine pupils are unreliable in their assessments of themselves in this respect; perceived post-event benefits do not accord with emotions expressed at the time. Undoubtedly the long term influence of these tensions within individuals, whether they are resolved or intensified, is likely to influence their future attitude to conserved areas. The researcher has however, been unable to trace any evidence upon which expectations could be based.

Question C23 was perhaps the most difficult of the three to answer, which is reflected in the fact that it was attempted by only 229 pupils (74,84% of the sample). Of these 216 (94,32%) answered in the affirmative, while 13 declared that they personally would be unlikely to benefit. How many of the 77 non-answers would fall into the latter category remains conjecture. Significantly the 13 negative answers were all among the 19 pupils who did not answer question C18. The range and pattern of affirmative answers are categorised in Table 8.3, from which two points of interest emerge: the substantial degree of correspondence with the results of question C3, giving the overall response patterns a slightly hedonistic tinge, but coupled with this is a noticeable streak of selflessness.

Relating these results back to the reasons for conservation, it is evident that among the sample group there is a strong awareness of benefits to be derived and a widespread belief that benefits are in fact being felt and experienced at a personal level. It is clearly not coincidence that the single major factor to emerge from question C18 was 'holidays', so that one might provisionally conclude that, unconsciously

at least, reasons for conservation, as seen by the sample, correlate closely with perceived personal benefit.

TABLE 8.3 CATEGORIZATION OF AFFIRMATIVE RESPONSES TO QUESTION C23

n*	CATEGORIZED RESPONSES
77	Conservation a major source of pleasure and relaxation (mainly in terms of beauty).
60	Benefit by learning and observing the 'ways of nature'.
46	Solitude, spiritual benefits of change and relief from city life.
21	Future generations to experience nature.
11	Better health.
5	Career possibility.
4	That nature benefitted was sufficient reward.
2	Invalid responses.

\* 10 pupils gave two reasons, giving a total of 226 responses.

N = 216

On the other hand, there is evidence of widespread, if amorphous, empathy for the concepts of conservation and the existence of conserved areas. Pupils in the survey have indicated that they have experienced and felt the sort of emotions which conservationists say people will or should experience. However poorly developed internalisation and verbalisation of these concepts may be at the age of 17, they represent potentially a powerful pro-conservation lobby of the future — in the western cultural milieu at least. If further individual development can lead to a wider appreciation of the four major considerations justifying conservation and the implementation of these at a level meaningful to the majority of people, the future and long term existence of conserved areas, while not assured, at least becomes a possibility.

#### 8.4 Problems in environmental conservation

Volumes have been written on the innumerable and varied problems facing

environmental conservation in general and nature conservation in particular. Among the more concise works on the topic are those of Nicholson (1972), Ward and Dubos (1972) and Ward (1979), while Clarke (1974) offers a sweeping coverage of the South African situation. In parts of the world some of the problems have been solved, overcome or delayed, often only temporarily, while in other places they are so overwhelming in complexity and magnitude that there is little, if any, future for the conservation of natural environments and none at all for the concept of conserved areas along the lines of the European/North American model. Virtually nowhere is conservation devoid of problems or the environment free of possible despoliation. The present and future state of the environment has become a global problem of enormous complexity which will ultimately demand global solutions.

While this research has concerned itself primarily with conservation relating to the natural environment, the wider reference within which this issue is set has not been ignored. In this section pupils' views on both these areas are examined and although no attempt is made to segregate these closely related issues other than on grounds of emphasis, from a purely functional point of view they are dealt with sequentially. The first group of questions examined (questions D1, D2 and D5) have a broad environmental emphasis, while the second group (questions C22 and D3) are concerned more specifically with nature conservation. The basis upon which the factors listed in questions D2 and D3 were determined was their applicability to South Africa, while for question D5 the major consideration was the universality of the problems (Burton, 1975). Questions D1 and C22 are open-ended\*.

#### 8.4.1 The wider reference

Question D1, in which pupils were asked what they saw as the most important environmental problems facing both South Africa and the world, (AVI: "Say if you think there are no such problems.") sought to obtain the views

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\* Subsequent to the present survey, the National Veld Trust conducted a public opinion poll on 'Environmental Degradation in South Africa'. This was carried out during the first half of 1981 and results were expected to be published late in 1981 or early in 1982 in Ekos Vol.1 No.4. They were not however available to the researcher at the time of finalising the present dissertation.



of pupils before presenting them with the suggestions and alternatives embodied in subsequent questions. 216 pupils responded to the question of whom 211 (68,95% of the sample) answered both sections. No pupil said there were no problems. It was answered by proportionately more Afrikaans than English speaking pupils (78,31% v 66,24%); more urban than rural pupils (75,40% v 63,92%), but approximately equal proportions of males and females (75,02% v 75,47%). The number of problems named by individuals for each of the two parts varied from one to seven. These are listed in Table 8.4 in a form illustrating diversity of suggestions, frequency of mention and ranked order of perceived importance for both South Africa and the world.

Examination of the table shows the overall response to the question to be characterised by the variety of topics listed. Prominence was given to issues with high publicity profiles, such as pollution of various kinds and the population explosion. There is a degree of concurrence between world and South African perceptions, at least in ranked order, if less so in magnitude e.g. 'general pollution', 'population explosion' and 'expansion of cities'. There are also however some substantial disparities in perceived problems, as in the cases of the importance of soil erosion and veld fires. Also, embedded in the population figures concerning South Africa, are fingers pointed at other racial groups, which does not occur in the world listings. Further points of comparison are that 'mine dumps/mining' and 'threats to game reserves' are seen only in terms of South Africa, where the real threat in these respects are comparatively small.

After the free expression allowed in question D1, question D2 required pupils to act within a structured framework, the question and accompanying instructions reading as follows:

Question D2: Do you think our environment and South African way of life are threatened by any of the following phenomena?

Soil erosion	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Depletion of our mineral resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Inadequate protection of our wild birds and animals	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Inadequate protection of some of our wild and beautiful places e.g. forests and estuaries	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Inadequate water supplies	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Chemical pollution of our rivers	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atmospheric pollution	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Poor farming methods	<input type="checkbox"/>	<input checked="" type="checkbox"/>

TABLE 8.4 RESPONSES TO QUESTION D1

CATEGORIZED PROBLEM*	FREQUENCY		RANK ORDER	
	WORLD	RSA	WORLD	RSA
<u>Pollution</u>				
General pollution	102	103	1	1
Air pollution	10	13	7	6
Water pollution	7	13	10	6
Oil pollution (sea)	1	4	20	16
Noise pollution	1	2	20	19
Nuclear waste	3	0	17	23
Destruction of ozone layer	1	0	21	23
<u>Habitat Modification</u>				
Soil erosion	7	32	10	3
Expansion of cities	17	25	4	4
Veld fires	4	12	15	8
Industrialisation	11	11	6	9
Poor farming/overgrazing	3	11	17	9
Destruction of virgin land	9	8	8	12
Mine dumps/mining	0	4	21	16
Encroachment of desert	1	1	20	22
<u>Population</u>				
Population explosion	90	38	2	2
Shortage of food	9	2	8	19
<u>Threat to Wildlife</u>				
Extinction of animal species	14	10	5	11
Not enough wild areas	7	8	10	12
Threat to game reserves	0	7	21	14
<u>Miscellaneous</u>				
Ignorance of people	19	15	3	5
Wars	6	3	13	11
Low rainfall/drought	5	5	17	15
Disease	3	2	17	19
Personal gain/greed	4	0	17	23
Earthquakes	1	0	20	23

\* It was considered more meaningful to group categories under broad headings than to arrange them in strict rank order based either on South Africa or the World.

(AVI: "First complete the white column by ticking only those blocks which you consider appropriate." [Time allowed for this]. "Now in the red column rank all eight points in what you would consider the order of likelihood e.g. 1 = most likely, 8 = least likely.")

282 pupils responded to the first part of this question, but the attempt at getting factors ranked was a complete failure; pupils did not understand what was meant by the term and were unable to grasp it in the brief explanation given (see Appendix B). Although the problem was apparent from the first school visited, time constraints did not allow for detailed explanations. The basic verbal instruction above was nevertheless given at each school, but in the final analysis only 23 pupils completed the task satisfactorily. These were considered too few upon which to base any deduction.

The results of the question, given in Table 8.5, again show pollution to be the major area of concern, a point to which we will return shortly. Also of interest, particularly in light of comments made earlier, is the high ranking of soil erosion. It would appear that, while not having considered it an environmental issue in the context of resource utilization, presented with it as a potential problem, its significance is readily recognised. So great is the gap here that the cause would almost certainly appear to lie in the method and context in which such a vital matter is taught, a suspicion further strengthened by the low level of importance accorded to 'inadequate water supplies' and 'poor farming methods' which are so closely related to soil erosion.

TABLE 8.5     RESPONSES TO QUESTION D2

FACTOR	FREQUENCY (n)	RANK ORDER
Chemical pollution of rivers.	247	1
Atmospheric pollution.	243	2
Soil erosion.	200	3
Depletion of mineral resources.	164	4
Inadequate protection of wild birds and animals.	158	5
Inadequate protection of wild and beautiful places.	156	6
Poor farming methods.	136	7
Inadequate water supplies.	108	8

N = 282

As far as wildlife and wild habitat aspects are concerned, conservationists will be gratified to find them both mentioned by over half of the sample. The general state of wildlife, in the sense in which we have used the term, is both dependent upon, and a barometer of, the state of all the other factors listed. What one would ultimately hope to see is little or no mention of these two factors, not because of an uncaring or uninformed public, but because the threat arising from other factors no longer existed.

Shifting the emphasis from identifying environmental problems to the relative importance of solving them led to the construction of question

D5: In order of importance for man's future well-being and happiness, complete the table below in the following terms:

- 1 very important
- 2 of some importance
- 3 of no importance
- 0 no opinion

	WORLD	S.A
Control of population growth		
Pollution control		
More careful use of resources & recycling		
The conservation of wildlife & natural areas		
The improvement of farming techniques & management		

(AVI: "There should be an answer in each block in this question.")

The question was satisfactorily answered by 279 pupils (91,18% of the sample), the results being summarised in Table 8.6 from which a number of salient points emerge. Based on the category of 'very important' pollution once again appears as the dominant perceived area requiring control, both worldwide and in South Africa. This is followed by population control for the world, but wildlife conservation for South Africa. Third comes population control for South Africa and wildlife conservation for the world, thereby showing strong overall concurrence with the results of question D1. The lowest rating goes to resource management/recycling and farming techniques, neither of which has a high publicity profile. Two other points of which note should be taken are the difference in magnitude both within and between the figures quoted and the

fact that 93,27% of all answers were either 1 or 2, thus possibly reflecting a youthful sense of urgency about these matters. The possibility of a proportionately loaded (i.e. 1,2,3) ranking of perceived overall importance was considered, but rejected as relatively meaningless as the categories were not on an interval scale.

#### 8.4.2 Nature conservation

In similar manner to question D1, question C22 attempted to obtain pupils' opinions before exposing them to potential answers by asking "What do you think most needs to be done for the best future of nature conservation in South Africa?"

Suggestions were offered by 232 pupils, amongst whom there were 50 of the 69 who had answered YES to C11, in which pupils were asked whether they thought enough was being done for nature conservation in South Africa. Whether they had misread question C11, were simply confused or nevertheless felt they were entitled to offer suggestions for improvement could not be determined. Altogether 296 suggestions were offered, categorised in Table 8.7, from which the major point to emerge was the emphasis placed upon education. It is interesting that this should be so in a country in which conservation education is, relatively speaking, still in its infancy. One might hope that pupils' views on the matter would act as a spur to those who are in a position to do something about it.

Question D3: If large numbers of people are allowed into game and nature reserves as might happen in the future, which of the following phenomena do you think might occur?

- |   |                          |
|---|--------------------------|
| Too much disturbance of wildlife & therefore decreased breeding | <input type="checkbox"/> |
| A severe litter problem   | <input type="checkbox"/> |
| Too much development e.g. restaurants, swimming pools etc.      | <input type="checkbox"/> |
| Increased damage of vegetation                                  | <input type="checkbox"/> |
| Increased danger of fires being started                         | <input type="checkbox"/> |
| Far more money coming to nature conservation                    | <input type="checkbox"/> |
| A greater appreciation of nature by the public                  | <input type="checkbox"/> |
| and therefore greater respect                                   | <input type="checkbox"/> |

TABLE 8.6 SUMMARY OF RESPONSES TO QUESTION D5

FACTOR	FREQUENCY OF RESPONSE FOR EACH CATEGORY*							
	WORLD				SOUTH AFRICA			
	0	1	2	3	0	1	2	3
Control of population growth	3	216	37	4	8	141	80	13
Pollution control	1	229	36	4	2	195	47	1
Careful use of resources and recycling	16	123	101	7	5	115	110	10
Conservation of wildlife and natural areas	15	163	65	5	11	150	79	6
Improvement of farming methods	25	117	91	7	25	125	93	3

N = 279

\* Percentage of answers in each category

0 - 4,31%

1 - 63,47%

2 - 29,80%

3 - 2,42%

TABLE 8.7    CATEGORIZED RESPONSES TO QUESTION C22

n	CATEGORIZED RESPONSE
126	Increase conservation education in schools and conservation awareness among general public.
65	Create more and larger parks, nature reserves etc. (2 referred to inner city areas).
26	Enforce rules more severely (21 were Afrikaans speaking).
19	Stop granting of hunting licences.
15	Cease all development in conserved areas i.e. dams, prospecting and housing.
11	Drastic reduction in amount of pollution permitted.
11	Miscellaneous suggestions.
8	Cheaper rates in parks to enable more people to visit and appreciate them.
7	Divert more taxes to conservation.
5	Ensuring proper management of parks.
3	Conservation films on television.

N = 232

(AVI: "Tick only the appropriate points here. Do not rank.")

This question was designed specifically to gauge opinion on environmental impact in finite conserved areas and is in logical sequence to the factors which have been considered.

One of the concomitants of a conservation aware public is an increased desire for participation in and utilization of natural resources, including conserved areas. An increase in use may also lead to conservation awareness, but the result is the same in that it brings its own set of problems in terms of environmental impact. The situation becomes particularly sensitive where conserved areas are small, conserve fragile or delicate ecosystems, or are viewed as the major recreational areas for large conurbations — problems already being experienced in acute form in Europe, parts of the USA and Japan.

The results of the question, answered by 293 pupils, are summarised in Table 8.8, the most striking feature of which is that the only two factors likely to be beneficial receive the lowest ratings. One is apt to wonder

to what extent this masks the pessimism of members of the sample group about the nature of their fellowmen. As may be expected at this stage, the two issues with the highest visual impact and publicity profiles, litter and fires, receive the highest ratings. The fire figure is extremely gratifying, given the proportions of this problem in Natal, but the litter issue must be regarded with some scepticism. Litter, a form of pollution, is unsightly, may be unhygienic and raises strong aesthetic objections, but its ecologically detrimental effect is minimal. The 'litter problem' is however the target of numerous environmental campaigns — for very good reasons and rightly so — and the results clearly show the effect of these. It is an object lesson in the value of intense campaigning against the perceived diminution of a 'personal benefits' situation.

TABLE 8.8    SUMMARY OF RESPONSES TO QUESTION D3

FACTOR	FREQUENCY (n)	RANK ORDER
Severe litter problem.	216	1
Increased danger of fires.	212	2
Increased damage to vegetation.	178	3
Increased disturbance and decreased breeding.	167	4
Too much development.	166	5
More money for nature conservation.	123	6
Greater appreciation of nature and greater respect.	123	6

N = 293

In drawing together the various aspects of the problem areas which have been examined, the major feature to emerge is the difference in values attached to what may be termed high and low profile factors. The former are exemplified by pollution in its various forms coming through consistently as the major area of concern, even though in ecological and environmental terms it may not always be the most important consideration. One is forced to ask to what extent an issue such as pollution may have become a conditioned reflex resulting from media bombardment and popularisation of literature on the subject, and to what extent it is an informed opinion. If it is the latter one might be forgiven for reacting with a



mixture of satisfaction from the awareness point of view and deep concern for the realities of the situation. If it is the former, public opinion on the issue, not being based on sound foundations, could conceivably be reversed by a series of skilful and well managed campaigns.

If the emphasis placed by the pupils upon certain factors is compared with the situation outlined in Chapters 2 and 3, their views do not always accord with known facts. Low profile, but critical, factors such as habitat destruction tend to be overlooked, while the high profile factors tend to be overemphasised. This provides an interesting parallel with observations arising from the Conservation Awareness Test in which we noted the greater concern with animals than with the plants upon which they ultimately depend.

Considerations such as these lead us directly to the question of commitment and the extent to which such feelings might be translated into action. Both the cynic and sceptic have their place here, but the idealist as well as the pragmatists might ask, in the light of apparent heightened awareness achieved on issues such as pollution, whether with concerted effort a similar situation could not be achieved in other critical areas. Awareness, no matter how ill-defined and amorphous, is surely better than ignorance and it is often the necessary first step towards a real sense of what Disch (1970) has termed 'the ecological conscience'.

#### 8.5 Commitment to conservation

It is commonplace that verbal commitment does not necessarily correlate with actual commitment and indeed on some occasions may be almost the opposite of what is practised. This section sets out to look briefly at perceived commitment to conservation on two levels, public and personal, and in so doing to highlight discrepancies and anomalies as far as the sample group is concerned.

### 8.5.1 Perceived public commitment

Attitudes on this issue are covered by four questions in which pupils are asked whether they think enough is being done for nature conservation and conservation education (questions C11 and C12); for an assessment of their local environment (question C9); and how they feel a hypothetical R100 might be spent when there are alternative demands upon it, some conflicting with conservation interests (question C21). All these questions are necessarily related to South Africa as it was felt that pupils were unlikely to be equipped to deal with them on a wider basis. The four questions are:

Question C11: Do you think that we in South Africa are doing enough for nature conservation?

Question C12: Do you think that we are doing enough in educating people about nature conservation and the reasons for it?

Question C9: Do you think your home town has enough parks and open or wild spaces in it?

Question C21: Assuming that you are a taxpayer paying R100 p.a., how would you divide it among the following causes?

Provision of housing for the lower income groups and poor	<input type="checkbox"/>
Reduction of personal income tax	<input type="checkbox"/>
Wildlife conservation	<input type="checkbox"/>
Building of new highspeed freeways	<input type="checkbox"/>
Building of a new sports stadium	<input type="checkbox"/>
Subsidizing food to make it cheaper	<input type="checkbox"/>
Removing taxes on luxury goods	<input type="checkbox"/>

Responses to questions C11 and C12 are shown by standard groupings in Tables 8.9 and 8.10 respectively. In both cases the results are characterised by the substantial degree of uncertainty expressed and by the fact that close to half of the pupils state NO. Among the approximately 22% answering YES to both questions, there is a remarkable amount of concurrence; 66 out of the 69 (95,65%) answering YES to question C11 also said YES to question C12. For the NO and NOT SURE answers the corresponding figures are 78,70% and 63,26% respectively.

TABLE 8.9      RESPONSES TO QUESTION C11 BY STANDARD GROUPING (%N/n)

RESPONSE	TOTAL	U	R	♂	♀	A	E	n
YES	22,62	20,41	26,60	19,87	25,50	27,87	19,12	69
NO	45,26	42,35	50,46	50,00	40,27	50,00	42,08	138
NOT SURE	32,13	37,24	22,94	30,13	34,23	22,13	38,80	98
n	305	196	109	156	149	122	183	

N = 305

TABLE 8.10      RESPONSES TO QUESTION C12 BY STANDARD GROUPING (%N/n)

RESPONSE	TOTAL	U	R	♂	♀	A	E	n
YES	22,37	21,54	23,85	22,43	22,30	25,00	20,65	68
NO	55,59	58,46	50,46	55,13	56,08	51,67	58,15	169
NOT SURE	22,04	20,00	25,69	22,43	21,62	23,33	21,19	67
n	304	195	109	156	148	120	184	

N = 304

While some might be inclined to dismiss these opinions as ill-informed, they are probably no less informed than those of the general public, and possibly better so, as was suggested by evidence presented in Chapter 5. In the case of question C11 it can also be pointed out that there is close correspondence to the informed opinion synthesized in Chapter 3, while for question C12 it may be argued that standard nine pupils are in a strong position to express their views on the schooling and education which they have received. In the researcher's personal experience, senior high school pupils are generally more perceptive than they are given credit for, in assessing the quality of these experiences. It is true that there may be a tendency to equate what they have received in terms of

conservation education to what is in fact being done for conservation in general, but this does not in any way devalue their viewpoint, as in the long run the two factors are inseparable.

Question C9 was a straightforward opinion survey based upon an area in which the Town and Country Planning Association in Britain, through its education medium, the Bulletin of Environmental Education, has expressed strong and consistent interest over the past several years. It was accepted that many of the pupils may not have previously thought about the issue, particularly if their lifestyle did not necessitate the need for and use of such facilities; a point which should be linked to the high conserved area visitation figures discussed in sections 6.2.6 and 6.2.7, as well as attention drawn to under-utilization of local facilities under the heading of Question A8.

Notwithstanding these factors, the results of the question, shown in Table 8.11, are characterised by a split of opinion slightly in favour of the NO vote, particularly by those sub-groups least likely to visit conserved areas i.e. females, urban and Afrikaans speaking pupils (refer to Table 6.10 on p.147). It is also calculated that, based on total numbers, 68 out of the 95 pupils (71,57%) in the area specifically demarcated in Table 6.13 (p.152) answered YES to question C9, thus further suggesting a relationship between mobility in the sense of being able to visit conserved areas and satisfaction with local facilities of the type under consideration. This is in a sense surprising as one might have expected this group to demand higher standards in their local environment. We must also allow however for the possibility that pupils in certain areas may in fact be well catered for in terms of the question. Clearly further investigation, including a home residence factor, is required before any decisive conclusions can be reached. The real lesson of these results is that over half of the pupils are not satisfied.

The specific purpose of question C21 was to gauge what sort of value pupils would place on wildlife conservation in relation to alternative demands for limited money. The alternatives listed are by no means exhaustive, but were selected on a basis of imagined importance to 'the man in the street'; issues which pupils would hear discussed at home and among friends.

The most significant, but deliberate, omission was the emotive issue of 'defence'. This was reflected by the fact that numerous pupils enquired about it. They were told to keep to the list given, but 19 individuals felt sufficiently strongly to write it in underneath. This, in the researcher's opinion, further justified its omission as the matter tends to cloud overall judgement.

TABLE 8.11 RESPONSES TO QUESTION C9 BY STANDARD GROUPING (%N/n)

RESPONSE	TOTAL	U	R	♂	♀	A	E	n
YES	43,09	41,33	46,30	45,16	40,94	39,34	45,60	131
NO	52,63	54,08	50,00	50,97	54,36	56,56	50,00	160
NOT SURE	4,28	4,59	3,70	3,87	4,70	4,41	4,40	13
n	304	196	108	155	149	122	182	

N = 304

A number of pupils were either unable to or did not wish to answer the question in the form in which it was presented, correctly completed responses being received for only 255 individuals (83,33% of the sample). The results moreover are subject to the greatest suspicion as regards their validity. Examination of Table 8.12 readily reveals this.

The overall proportion allocated to wildlife conservation was considered to be excessively high and probably occurred for three reasons:

- a. At this stage of the questionnaire, pupils were into the spirit of the survey and reacted accordingly. Suspicion that the reaction would have been different if the question had been placed earlier prompted a further survey among 92 standard nine boys to whom access was available. The results, shown comparatively in Table 8.12, speak for themselves. Wildlife conservation is seen in a far clearer perspective.

TABLE 8.12 RESULTS OF QUESTION C21 SHOWING PERCENTAGES ALLOCATED BY SAMPLE GROUP AND CHECK GROUP

FACTOR	SAMPLE GROUP	CHECK GROUP
Housing for lower income groups.	20,73	24,04
Reduction of personal income tax.	12,36	11,00
Wildlife conservation.	27,68	16,05
Building of new freeways.	6,77	8,81
Building of new sports stadium.	10,95	7,35
Subsidizing food.	15,37	23,56
Removing taxes on luxury goods.	6,15	9,18
n	255	92

N = 255

- b. The inflating tendencies of females and rural pupils as shown by Table 8.13.
- c. It became apparent from post-test questions that most pupils had little idea of the scale of costs which were involved in the various alternatives.

It is therefore suggested that any future survey of this nature might give consideration to a more comprehensive list of alternatives, more time in which to consider the issue and a realistic scale of related costs e.g. unit distance of highway development in relation to running a national park for a year. A carefully conceived survey of this nature would constitute a substantial study in its own right.

#### 8.5.2 Perceived commitment at a personal level

Three questions, C5, C6 and C16, were designed sequentially to lead pupils firstly to indicate what they thought people ought to do and what they themselves might be able to do, and secondly to state what they as individuals had done for conservation. The three questions, all verbally administered, were:

Question C5: Do you think individual people should make some contribution towards nature and wildlife conservation?

TABLE 8.13 PERCENTAGE OF FUNDS ALLOCATED TO WILDLIFE CONSERVATION IN QUESTION C21 BY STANDARD AND BASIC GROUPING

TOTAL	U	R	♂	♀	A	E	Um	Uf	Rm	Rf	Um	Uf	Rm	Rf
27,68	25,01	31,24	25,61	30,53	27,46	27,88	26,80	26,36	22,96	34,64	20,74	26,15	29,51	48,00
n 255	181	74	132	123	94	161	26	39	13	16	58	58	35	10

N = 255

Question C6: What sort of contribution do you think an 'ordinary' person such as yourself can make?

Question C16: List some of the things which you have done for wildlife or nature conservation.

Question C5 was answered by 305 pupils, of whom 282 (92,46%) stated YES, seven (2,29%) NO and 16 (5,25%) NOT SURE. Thus in principle nearly all pupils thought that individuals ought to make some sort of contribution towards nature and wildlife conservation. Pressed as to what sort of contribution might be made, 277 (98,23%) of these pupils, all in the YES bracket of question C5, responded with a total of 401 suggestions. Of these, categorised in Table 8.14, 200 could be regarded as 'active' suggestions i.e. that some action should take place, while 201 were 'passive' and often vague in content, suggesting largely that people contribute by behaving themselves or by not doing various things.

TABLE 8.14    CATEGORIZATION OF RESPONSES TO QUESTION C6

n	'ACTIVE' SUGGESTIONS
136	Financial contribution of some sort.
17	Make an effort to become aware and/or actively disseminate knowledge.
16	Joining nature conservation bodies (only eight actually belonged), attending courses and forming action groups.
15	Cleaning parks, building projects and animal care.
12	Creating a demand by visiting reserves.
4	Policing other peoples' behaviour.
n	'PASSIVE' SUGGESTIONS
94	People must make an effort not to pollute. (53 specified not littering).
23	'Conserve nature' - no further elaboration.
21	One should not damage plants, harm animals or collect birds' eggs.
21	Prevent fires.
14	Obey rules.
11	Do not hunt.
7	Any effort to conserve and protect should be concentrated on one's own (immediate) environment.
7	Hunt with care.
3	Miscellaneous: 'prevent soil erosion', 'don't use herbicides', 'control man's population'.



Where the issue of contributions was brought to a personal level in question C16 fewer still pupils responded. Of the 259 who did so, 131 (50,58%) listed things which they had done and 128 (49,42%) said they had done nothing, although 20 of these said that while they would like to help they did not know how to go about it. The 131 affirmative answers (42,81% of the sample) led to 208 items being listed, which have been grouped into 15 categories, again under the broad headings of 'active' and 'passive', as shown in Table 8.15.

TABLE 8.15      CATEGORIZATION OF RESPONSES TO QUESTION C16

n	'ACTIVE' ITEMS
80	Made a financial contribution (parents?).
26	Involved in litter clearance campaigns.
26	Cared for sick animals and birds (proportion of domestic animals?)
10	Involved in planting indigenous trees.
10	Shooting feral dogs, removing snares or catching poachers.
3	Involved in trail construction.
3	Operate bird feeding tables in Durban city area.
2	Involved in donga reclamation.
1	Breeds wild birds for release.
1	Participated in conservation awareness campaign.
1	Worked for the S.P.C.A.
1	Helped with culling.
<hr/>	
n	'PASSIVE' ITEMS
24	Listed various rules which they had adhered to.
11	Attended courses or visited conserved areas.
5	Claimed membership of conservation organisations.

N = 259

It is particularly important in this question to bear in mind that we are looking at pupils' perceived contributions, which do not necessarily correspond to their real contributions. We have no information on either the quality or quantity of what they say they have done or given. Further-

more the importance with which the action is viewed by the pupils is totally relative and we have no idea of the significance which may be attached to it: what was listed by one pupil might not have been regarded as worth listing by another.

If however, answers are accepted at face value, we may proceed to an analysis of consistency between verbal and actual commitment. Table 8.16, which is constructed to illustrate only the affirmative answers, shows that fully 46,45% of pupils answering YES to question C5 answered affirmatively to question C6 and had done something themselves. 51,77% of pupils answering affirmatively to the first two questions had failed to act themselves. Thus within the limitations noted, 'believers and doers' in the sample are very closely matched with 'believers only'. Nearly a half of those who talk of commitment are prepared to act in some way.

TABLE 8.16 CONSISTENCY PATTERN OF AFFIRMATIVE VIEWS EXPRESSED IN QUESTIONS C5, C6 AND C16

QUESTION	C5	C6*	C16	n	% of n (= 282)
C5	YES			282	100,00
C6	YES	+		277	98,23
C16	YES	+	Contribution	131	46,45
	YES	+	No contribution	146	51,77

\* + refers to positive answers to C6.

In summary we may conclude that while pupils expect a high level of public commitment to the cause of conservation, their personal verbal commitment is also high. Actual commitment is somewhat lower, though by no means poor, thus agreeing in principle with Maloney and Ward (1973) and Maloney, Ward and Braucht (1975), but disagreeing in detail of scale. We may within the limitations of this survey on this issue at least, dispute their use of the term 'most persons' (see section 1.6). We should also not 'write off' pupils who do not have an active commitment. Active participation in its propagation is not a moral prerequisite for believing a cause to be right. In other words, purely verbal commitment to

conservation is better than no commitment. Another feature which re-emerges and correlated with conclusions reached in Chapter 6 is the need for pupils to have an effective vehicle for active participation. Apart from the presently existing programmes outlined in Chapter 3, South Africans might do well to look at what is being done in the United Kingdom, Netherlands, USA and Australia. One may consider for example the work of the British Trust for Conservation Volunteers, the U.S. Department of Agriculture and the Australian Conservation Foundation. Evidence points increasingly to the need for recognition of this problem as the major challenge facing environmental education in South Africa.

#### 8.6 Contradictory values

We now turn our attention to a common attitude towards nature and wildlife conservation. It is what is often termed the 'double-standards syndrome' where individuals tend to see rules and regulations as applying rather more to others than to themselves. Although writers on conservation problems often make passing reference to the matter of individuals holding contradictory sets of values, the researcher has been unable to locate any documented work or empirical evidence on the topic.

Three areas were chosen for a provisional survey in this field, these being 'hunting, poaching and hunger', 'implementation of rules and regulations' and 'economic and physical development'. The basis of selection was the widespread nature of these 'problem areas' and the belief that most of the sample would be familiar with them in principle, if not from first-hand experience. They are moreover perennial problems faced by conservationists everywhere. Although questions such as these are loaded with moral, ethical and emotional components, every attempt has been made to present them in a neutral light, and for the present purpose they are examined only in terms of whether they display patterns of contradiction or not.

### 8.6.1 Hunting, poaching and hunger

Five questions were formulated around this topic. Two (questions C1 and C2) sought views on hunting, although no specific mention was made of legal considerations, two (questions C7 and C10) sought views on poaching i.e. illegal hunting, while the fifth (question C15) concerned air rifles, more commonly known as pellet guns. Attention is also drawn to the fact that the questions were all verbally administered in their numerical order, so that it was not possible for answers to be aligned in terms of questions which were to follow.

The specific purpose of questions C1 and C2 was to determine to what extent the introduction of rational knowledge into an emotional issue might influence judgement. The questions and the verbal explanation accompanying question C2 were as follows:

Question C1: Do you approve of hunting?

Question C2: Do you approve of hunting on a sustained yield basis?  
Why?

(AVI: "'Sustained yield' means hunting in such a way that the actual number of animals is not reduced over a long period of time. Each year only a number roughly equivalent to the previous year's increase is hunted so that one has an annual 'crop'.")

Both questions were answered by 305 pupils, the results of which are given in Table 8.17 and from which the following general points emerge:

- a. A massive swing in opinion after the provision of additional information. 71,24% of pupils who said NO to question C1 said YES to question C2, while the corresponding figure for the NOT SURE group was 62,26%.
- b. Males, rural and Afrikaans speaking pupils were most likely to approve of hunting with or without the concept of a sustained yield being applied.

Apropos the second point, the likelihood exists that in all three sub-groups there are elements with either a personal experience of hunting or a strong cultural influence in this respect, factors which are more than likely absent among their sub-group counterparts. Allowance must be made for the fact that many protagonists of hunting assume, without

question, that it is subject to certain rules and ethical standards. By contrast it is almost certain that a proportion of urban, female and English speaking pupils were, in question C1, reacting against an issue about which they knew very little, a point borne out not only by their change of view, but by the 256 reasons given by 248 pupils answering question C2. These are summarised in Table 8.18.

TABLE 8.17    RESPONSES TO QUESTIONS C1 AND C2 BY STANDARD GROUPING (%N/n)

QUESTION C1

RESPONSE	TOTAL	U	R	♂	♀	A	E	n
YES	32,46	26,90	42,59	42,31	22,15	45,08	24,04	99
NO	50,16	52,79	45,37	42,95	57,72	42,62	55,19	153
NOT SURE	17,38	20,30	12,03	14,74	20,13	12,29	20,76	53
n	305	197	108	156	149	122	183	

N = 305

QUESTION C2

RESPONSE	TOTAL	U	R	♂	♀	A	E	n
YES	79,02	76,65	83,33	76,92	81,21	82,79	76,50	241
NO	14,43	17,26	9,26	14,74	14,09	12,29	15,85	44
NOT SURE	6,56	6,09	7,40	8,33	4,70	4,92	7,65	20
n	305	197	108	156	149	122	183	

N = 305

The fact that some pupils consistently stated NO in question C2 reflects neither on their sense of judgement nor on the concept of sustained yield. Logical and ethical arguments exist both for and against hunting. The fact that some pupils have a grasp of this is again evident from Table 8.18.

TABLE 8.18 SUMMARY OF REASONS ACCOMPANYING QUESTION C2

n	REASONS
<u>RELATING TO 'YES' ANSWERS</u>	
59	Need to control numbers and prevent overpopulation without explaining why.
49	Overgrazing and because animals outstrip their food supply.
35	Provides some form of control of hunters in terms of species shot and numbers killed.
30	Maintain a 'good balance' without the threat of extinction - no further elaboration.
9	'Need' to hunt for recreation.
9	Control of dominant species within enclosed areas.
7	Breeding would improve.
5	Concerned that the 'young bulls' (rams) should be given a chance.
2	Food supply.
<u>RELATING TO 'NO' ANSWERS</u>	
8	Hunting for pleasure is wrong; only justified by food requirements.
7	Man has no 'right' to interfere with nature.
7	Wanted numbers of animals to increase.
6	Expressed a fear of extinction.
4	Life is sacred and man should not kill.
4	Invalid answers.
3	Would only approve if same principle were applied to humans.
1	Culling must be scientific.
1	Export excess to zoos.
<u>RELATING TO 'NOT SURE' ANSWERS</u>	
8	Reasons given placed them in the NO camp e.g. 'opposed to killing', 'hunting is unnecessary'.
1	Gave qualified support to hunting if population density outstripped food supply.
1	Invalid answer.

N = 248

Closely allied to hunting, either for sport or food, is what is termed poaching. While it may appear to be basically no more than hunting without permission from relevant authorities, it generally contains two elements not normally associated with licensed hunting i.e. it is uncontrolled in terms of numbers, species and sex taken and in the methods used for trapping or killing. Much of White public repugnance against poachers and poaching results from the publicity given to the latter aspect, while the widespread legal use of gintraps and other gruesome methods used against predators, particularly jackal (Canis mesomelus) and lynx (Felis caracal) are conveniently overlooked. It is true too that poaching is usually, in the eyes of Whites, associated with Blacks, although the practice is by no means confined to them. It is also often incorrectly thought of as the major threat to nature conservation. While this is true in some parts of the world it is not the case in South Africa, where it is also more often associated with protein deficiency than with financial gain. This is partly the reason for the insertion of the term 'food' in question C7. Other reasons were, firstly, to draw a sharp contrast with the circumstances in question C10 and secondly, to get a response based on principle rather than on race prejudice.

The questions, both verbally administered, were:

Question C7: Do you think that a man caught poaching for food in a game reserve should be:

Severely punished	<input type="checkbox"/>
Mildly punished	<input type="checkbox"/>
Not punished at all	<input type="checkbox"/>

Question C10: If you had not eaten for five days and had the opportunity of trapping a small antelope, would you do it?

302 pupils answered question C7 and 301 answered question C10, the results of which are shown by standard grouping in Table 8.19. Response combinations for the two questions are shown in Table 8.20.

Examination of Table 8.20 shows that while a majority favoured 'severe punishment' for poachers, 63,13% of the same individuals (101/160) admitted that if placed in a similar position they would not act differently. It is doubtful however, given the normal behaviour of human beings, whether

TABLE 8.19 RESPONSES TO QUESTIONS C7 AND C10 BY STANDARD GROUPING (%N/n)

## QUESTION C7

RESPONSE	TOTAL	U	R	♂	♀	A	E	n
Severely punished	53,31	44,10	70,09	54,25	52,35	51,24	54,70	161
Mildly punished	39,40	47,18	25,23	37,91	40,94	38,84	39,78	119
Not punished	7,29	8,72	4,67	7,84	6,71	9,92	5,52	22
n	302	195	107	153	149	121	181	

N = 302

## QUESTION C10

RESPONSE	TOTAL	U	R	♂	♀	A	E	n
YES	70,76	73,10	66,06	85,35	55,03	75,95	69,02	213
NO	13,67	12,18	16,51	5,09	22,82	13,11	14,13	41
NOT SURE	15,61	14,72	17,43	9,55	22,15	13,93	16,85	47
n	301	194	107	153	148	120	181	

N = 301

TABLE 8.20 RESPONSE COMBINATIONS OF QUESTIONS C7 AND C10

C7 RESPONSE	n	% of N	C10 - RESPONSES FOR SAME PUPILS					
			YES	%n	NO	%n	NOT SURE	%n
Severely punished	160*	53,16	101	63,13	29	18,13	30	18,75
Mildly punished	119	39,53	85	71,43	14	11,76	20	16,81
Not punished at all	22	7,31	22	100,00	0	0,00	0	0,00
TOTAL n	301	100,0	208	69,10	43	14,29	50	16,61

\* The one extra pupil in C7 was dropped from this category to facilitate comparison.

N = 301



they would then favour severe punishment for themselves. It is also fairly safe to assume that few if any of the 29 who claimed they would not trap a small antelope had ever experienced as much as two days without eating so that 'not having eaten for five days' is relatively meaningless.

The pattern repeats itself for those pupils opting for mild punishment except that in harmony with their more lenient approach, the percentage (71,42%) who would themselves poach is higher. The 22 pupils who would not punish other poachers and be prepared to poach are probably the most honest of all with themselves. This does not suggest that no lie factor exists, but rather that it is very small.

In terms of sub-group differences, the major point of interest arising from question C7 lies in the harsher treatment favoured by rural pupils, who presumably had among their ranks individuals with first-hand experience of poachers. It is considered highly significant that all but three of the 49 farmers' children opted for severe punishment. The other important point of difference lies in the expressed views of males and females as to whether or not they would poach. Females were far less certain of how they would act.

The purpose of question C15: Do you approve of pellet guns? Explain your answer, was to gauge pupils' reactions to what has periodically emerged as a controversial issue in South Africa, particularly when suffering is caused to humans. Many conservationists hold the view that pellet guns, used in the guise of man's hunting instinct, cause a great deal of unnecessary injury and maiming to small animals, particularly wild birds. Options in the question were deliberately limited to YES or NO in an experimental attempt to force an answer.

303 pupils responded to the first part of the question, of whom three wrote 'unsure' on the answer paper. 233 pupils responded to the second part of the question, giving a total of 245 reasons. Opinions on the subject, reflected in Tables 8.21 and 8.22, were sharply divided both in total and between sub-groups, particularly along lines of sex, where

females are very much more strongly opposed. It is interesting too that rural pupils are less in favour than their urban counterparts. The possibility must be allowed that their attitudes result in part from greater familiarity with real firearms and possibly a greater awareness of their potential danger.

TABLE 8.21 RESPONSES TO QUESTION C15 BY STANDARD GROUPING (%N/n)

RESPONSE	TOTAL	U	R	♂	♀	A	E	n
YES	48,18	50,51	43,93	63,87	31,76	46,72	49,17	146
NO	50,83	48,47	55,14	34,19	68,24	52,46	49,72	154
NOT SURE	0,99	1,02	0,93	1,93	0,00	0,82	1,11	3
n	303	196	107	155	148	120	183	

N = 303

One of the interesting features to emerge from Table 8.22 is that similar arguments are used by both sides. Even the most ardent protagonists of the use of pellet guns would be hard put to deny that, on the basis of expressed opinions, those approving of their use provide as sound an argument for their banning or strict control as do those who take up the opposite view\*. In conservation terms the information given speaks largely for itself.

Having now examined a number of separate but related features of man's relationship with wild creatures it is almost unnecessary to remind ourselves of man's primitive origins and his essentially predatory nature. Hunting, poaching and using pellet guns are essentially different

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\* Subsequent to this survey legislation has been passed in Parliament which requires the licensing of pellet guns.

TABLE 8.22 CATEGORIZATION OF VIEWS EXPRESSED IN QUESTION C15

n	VIEWPOINTS
<u>CORRESPONDING TO 'YES' ANSWERS</u>	
60	Qualified reasons with phrases such as 'only if in good hands' (4), 'only if not used on birds or animals' (7), 'for target shooting only' (24), 'only under parental supervision' (1), 'only by those aware of dangers' (1), if 'used correctly' for 'the right thing' (19), 'stricter laws about them should be enforced' (3), 'can be dangerous sometimes' (1).
42	Debatable reasons i.e. 'educates' boys in the use of a weapon (22), 'Maintains the balance of nature' (2), 'it's not the gun that does the damage' (3), 'aren't dangerous - only sting' (4), 'boys who own a gun are more mature' (3), 'as a means of obtaining food' (2), 'needed for hunting' (1), 'a means of protection' (5).
16	Justified use of pellet-guns by their destructive and harmful properties i.e. 'it can't kill very well' (1), 'for pests' i.e. Indian Mynahs, rats and 'sparrows eating fruit' (9), 'can shoot small animals and birds' (4), 'fun to shoot dogs' (2).
15	'Sport', 'entertainment' or 'enjoy shooting'.
<u>CORRESPONDING TO 'NO' ANSWERS</u>	
40	Wound or maim rather than kill.
39	Concerned that wild birds are prime targets.
17	Could cause accidents which can permanently maim (2 cited personal experience).
16	Miscellaneous reasons i.e. 'should be used for targets only' (2), 'can encourage hunting in small boys' (2), 'if a child is old enough to own a gun he should use a proper rifle' (2), 'don't approve of any guns' (3), 'give animals frights' (1), 'are ruining nature' (3), 'a dangerous weapon - to be used only under supervision' (2), 'serve no useful purpose' (1).
13	Children are too reckless to handle guns.
10	Dangerous to small children.
8	Objected to animals being killed for fun.
7	Pellet guns are frequently abused.

N = 233

manifestations of the same instincts and behaviour patterns. Whether one poaches or hunts depends to a large degree which side of the economic fence one is on. Among neighbouring clans of hyenas those with plentiful food resources may openly hunt, while their less fortunate neighbours scavenge for what they can. It appears to be not entirely coincidental that of the 99 YES responses to question C1, 73 (73,73%) opted for severe punishment in question C7 and 91 (91,91%) answered YES to question C15.

#### 8.6.2 Rules and regulations

This aspect was covered by two questions:

Question C4: Are rules and regulations for man necessary in the wild?

Why?

Question C14: If you knew you would not be caught breaking a rule in a game reserve, might you break it if you could gain something from it, such as a good photograph?

Apart from the context in which they were constructed, the responses to these questions are potentially comparable with similar aspects of a study reportedly being undertaken on American students (R.W. West, pers. comm.\*).

The first portion of question C4 and question C5 were answered by all 306 pupils in the sample. Results, shown together for comparison in Table 8.23, clearly indicate overwhelming support for the existence of rules and regulations in theory (i.e. question C4) but fully 36,93% of the sample stated that they were willing to break rules when it suited them, while a further 21,57% were not certain whether they would keep to the rules or not (i.e. question C14). The results also indicate that rural, female and particularly Afrikaans speaking pupils are less willing to break rules

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\* R.W. West, Department of Education, University of Sussex, Brighton, England.

than their sub-group counterparts.

TABLE 8.23 RESPONSES TO QUESTIONS C4 AND C14 BY STANDARD GROUPING (%N/n)

QUESTION C4

RESPONSE	TOTAL	U	R	♂	♀	A	E	n
YES	95,42	94,42	97,25	92,99	97,99	95,90	95,11	292
NO	2,29	2,54	1,83	3,82	0,67	0,00	3,80	7
NOT SURE	2,29	3,04	0,92	3,18	1,34	4,10	1,09	7
n	306	197	109	157	149	122	184	

N = 306

QUESTION C14

RESPONSE	TOTAL	U	R	♂	♀	A	E	n
YES	36,93	38,07	34,86	41,40	32,21	22,95	46,19	113
NO	41,50	38,07	47,71	36,94	46,31	58,20	30,43	127
NOT SURE	21,57	23,86	17,43	21,66	21,48	18,85	23,37	66
n	306	197	109	157	149	122	184	

N = 306

283 of the pupils who answered YES to question C4 gave reasons for their decision. These reasons, categorised in Table 8.24, are generally sound, serving to illustrate that understanding of the reasons for rules does not necessarily lead to adherence. One detects too, a spark of faith in humanity among the seven pupils who said NO to question C4; all felt that people could and should be trusted and thus did not require rules. No reasons at all were offered by the NOT SURE group.

The consistency pattern of the two questions is shown in Table 8.25 by standard groupings. Referring to the total figures it will be noted that 40,20% of the total (or 42,12% of those answering YES in question C4)

were consistent in their attitude insofar as they were prepared to abide by the rules set for all. 1,63% were also consistent in that they disapproved of rules and intended to ignore them, 34,31% fell into the category in which rules were for 'other people', while a further 20,92% indicated a potential for joining them. Examination of the sub-group patterns mirrors the point made above concerning rural, female and Afrikaans speaking pupils.

TABLE 8.24      CATEGORIZATION OF REASONS ACCOMPANYING 'YES' ANSWERS TO QUESTION C4

n	REASON
66	To prevent destruction of the environment in general.
64	People cannot behave themselves without rules i.e. rules are needed for guidance.
38	Protect and prevent destruction of plants and animals.
28	Necessary for fire prevention.
26	Prevent people from doing as they please in a natural environment.
19	Rules are necessary, good, exist everywhere - no further elaboration.
17	Cleanliness and enforcement of litter control.
16	Protect people from danger.
5	Protect nature for future generations.
4	Invalid answers.

N = 283

Allowance must be made for the possibility that while 17 year old pupils might not break the rules they would like to think they would, the opposite may also be true given the right temptations. Many pupils of this age are also emerging from, or still passing through, the general rebelliousness sometimes associated with the mid-teens, so that it would be unrealistic to project these results too far beyond the sample group. Another factor to be considered, but for which we have no measure, is the relationship between willingness to disregard rules and their perceived seriousness. If the normal school situation is any guide, then generally the more petty, trivial or unimportant a rule is perceived to be, the less compunction individuals have about transgressing it, particularly if they feel they are unlikely to be caught.

TABLE 8.25 COMPARATIVE RESULTS OF QUESTIONS C4 AND C14 SHOWING NUMBERS AND PERCENTAGES OF TOTAL SAMPLE BY STANDARD GROUPING

RESPONSE COMBINATIONS		TOTAL		U		R		♂		♀		A		E	
C4	C14	n	%	n	%	n	%	n	%	n	%	n	%	n	%
YES	NO	123	40,20	72	36,55	51	46,79	55	37,41	68	42,77	68	55,74	55	29,89
YES	YES	105	34,31	69	35,03	36	33,03	58	39,46	47	29,56	27	22,13	78	42,39
YES	NOT SURE	64	20,92	45	22,84	19	17,43	33	22,45	31	19,50	22	18,03	42	22,83
NO	YES	5	1,63	4	2,03	1	0,92	5	3,40	0	0,00	0	0,00	5	2,72
NO	NO	2	0,65	1	0,51	1	0,92	1	0,68	1	0,63	0	0,00	2	1,09
NOT SURE	NOT SURE	2	0,65	2	1,02	0	0,00	1	0,68	1	0,63	1	0,82	1	0,54
NOT SURE	YES	2	0,65	1	0,51	1	0,92	1	0,68	1	0,63	1	0,82	1	0,54
NOT SURE	NO	3	0,98	3	1,53	0	0,00	3	2,04	0	0,00	3	2,46	0	0,00
n		306		197		109		157		149		122		184	

N = 306

Attitudes such as these have considerable implications for the managers of conserved areas, not least of which is the structure of regulations which they impose. Short concise lists of rules, particularly if they are coupled with a meaningful education programme, might more likely be adhered to than long lists of prohibitions and strictures. A good case study in this respect is that of the United Kingdom Forestry Commission. A situation of restricted entry to land controlled and a high incidence of vandalism in the late nineteen forties has been transformed into one of general open entry with a sharp decrease in damage caused by the public. It has however been accompanied by a vigorous education campaign, which despite gloomy forecasts regarding its costs, has resulted in a favourable benefit-to-cost ratio. In short, reasonable rules coupled with education have paid dividends (M. Orram, pers. comm\*).

### 8.6.3 Economic and physical development

In addition to reasons generally applicable to this section, the specific purpose of questions C8 and C20 was to ascertain pupils' views on the concept of environmental impact studies which are now common practice in the USA, much of Europe and the USSR, but not as yet in South Africa. Grimshaw and Briggs (1970), Storm (1971) and Deer and Smith (1976) have all drawn attention to the benefits of involving pupils in studies and a limited level of decision making in matters affecting their own environments. These sentiments have been regularly echoed by the Bulletin of Environmental Education, while Fyson (1976) has drawn attention to the conflicts which arise when this does not occur. To the writer's knowledge no studies of this kind have been carried out in South Africa.

The two questions with which pupils were presented and the additional verbal information given to them were as follows:

Question C8: Do you think that before any sort of development can take place an environmental impact study should be done to ascertain what the land is best suited for?

AVI (based on Studdart, 1974): "An environmental impact study is a care-

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\* M. Orram, Forestry Management Division, Forestry Commission, Corstophine Road, Edinburgh.



ful and detailed assessment of the potential influence which any development might have upon an area or region. It is carried out before any sort of development begins and may influence all decisions concerning that development. Its recommendations will usually be favourable to some people and unfavourable to others."

Question C20: If you owned a beautiful piece of country on which you wished to build your dream house and you were told that you had to sell it as the area was best suited to nature conservation, would you:

be very angry and refuse to sell

be annoyed but sell anyway

be quite happy to sell


The two questions were answered by 303 and 294 pupils respectively, with 292 responding to both questions. Results, shown by standard grouping in Table 8.26, again indicate overwhelming support for the concept in theory, but substantially modified views when respondents themselves stand to lose. Nevertheless only a small minority claim they would refuse to sell, although the majority not unnaturally state they would be unhappy about it. What is slightly suspicious is the high proportion of 29,59% who in question C20 claim they would be happy to sell. By the time pupils had reached question C20 many of them had realised, as indicated by their exclamations and behaviour, that they were being examined for consistency. Their decision was also an artificial one in that probably none of them had ever owned property. More than any other question pupils were saying how they thought they would act, rather than basing their judgement upon experience. It must also be borne in mind that while the question was centred around a principle, that principle had, through the course of the questionnaire, become tied to nature conservation. Substantial variation in opinion might have occurred if the alternative offered had been some other form of amenity or development such as a housing or industrial estate or a sports complex.

TABLE 8.26    RESPONSES TO QUESTIONS C8 AND C20 BY STANDARD GROUPING (%N/n)

QUESTION C8

RESPONSE	TOTAL	U	R	♂	♀	A	E	n
YES	88,12	90,26	84,26	88,39	87,84	89,26	87,36	267
NO	2,64	2,56	2,78	1,29	4,05	3,30	2,20	8
NOT SURE	9,24	7,18	12,96	10,32	8,11	7,44	10,44	28
n	303	195	108	155	148	121	182	

N = 303

QUESTION C20

RESPONSE	TOTAL	U	R	♂	♀	A	E	n
Refuse to sell	11,90	11,05	13,46	16,56	6,99	9,32	13,64	35
Sell anyway	58,50	62,10	51,92	59,60	57,34	61,02	56,82	172
Happy to sell	29,59	26,84	34,62	23,84	35,66	29,66	29,54	87
n	294	190	104	151	143	118	176	

N = 294

If, for investigative purposes, we assume results to be an accurate reflection of pupils' views, and examine consistency patterns, as displayed in Table 8.27, it is evident that of the 262 who initially stated YES only, 30 (10,27% of the sample) said they would refuse to sell. More than twice as many (26,37%) declared themselves willing to abide by their earlier decision supporting environmental impact studies. Examination of sub-group breakdowns indicates substantial variations of opinion between urban and rural pupils, a smaller but still substantial difference between males and females and relatively little difference between Afrikaans and English speaking pupils.

In summary of this section it has been established that among the sample group, operating in a western cultural milieu, there is clear evidence of the so called 'double-standard syndrome', although the extent to which this occurs is likely to vary considerably with different circumstances. Notwithstanding declared verbal commitment to the cause of nature conservation — in part at least because it is socially fashionable (Withrington, 1977) and sometimes economically prudent to do so — 'normal' human behaviour

TABLE 8.27 COMPARATIVE RESULTS OF QUESTIONS C8 AND C20 SHOWING NUMBERS AND PERCENTAGES OF N BY STANDARD GROUPING

RESPONSE COMBINATIONS		TOTAL		U		R		♂		♀		A		E	
C8	C20	n	%	n	%	n	%	n	%	n	%	n	%	n	%
YES	Refuse to sell	30	10,27	19	10,98	11	9,24	22	14,77	8	5,59	7	5,98	23	13,14
YES	Sell anyway	155	53,08	105	60,69	50	42,02	79	53,02	76	53,15	71	60,68	84	48,00
YES	Happy to sell	77	26,37	31	17,92	46	38,66	32	21,48	45	31,47	31	26,50	46	26,28
NO	Refuse to sell	1	0,34	1	0,58	0	0,00	0	0,00	1	0,70	1	0,85	0	0,00
NO	Sell anyway	5	1,71	3	1,73	2	1,68	1	0,67	4	2,80	2	1,71	3	1,71
NO	Happy to sell	2	0,68	1	0,58	1	0,84	1	0,67	1	0,70	1	0,85	1	0,57
NOT SURE	Refuse to sell	2	0,68	0	0,00	2	1,68	1	0,67	1	0,70	2	1,71	0	0,00
NOT SURE	Sell anyway	15	5,14	11	6,36	4	3,36	11	7,38	4	2,80	1	0,85	14	8,00
NOT SURE	Happy to sell	5	1,71	2	1,16	3	2,52	2	1,34	3	2,10	1	0,85	4	2,28
n		292		173		119		149		143		117		175	

N = 292

is likely to apply. Conservation cannot expect concessions or special considerations in this respect, no matter how strongly active minorities feel it should, which brings one back squarely to the reasons for conservation and the factors which are likely to have any real impact on its continued existence. Among these we can ignore neither man's primal instincts nor his ingrained cultural attributes. The superstructure of moral values and ethical standards rests upon these foundations which history has repeatedly shown to be egocentric and capricious. What, in this context, of the future?

### 8.7 Future expectations

Future expectations, in terms of optimism or pessimism, were elicited by questions D4 and D6.

Question D4 read as follows:

Do you think that mankind will perish in your lifetime?  
If you answered "Yes", rank the following from 1 to 6  
in order of likelihood:

Outbreak of nuclear war	<input type="text"/>
Air and water pollution	<input type="text"/>
Food shortage	<input type="text"/>
Drain of natural resources	<input type="text"/>
Spread of an incurable disease	<input type="text"/>
General degradation of the environment	<input type="text"/>

(AVI: "Tick the YES/NO choice, but only rank if you answered YES. If you said NO then rest for a minute.")

It was based upon a survey carried out on 400 Japanese children aged 10 - 11 years by Takahisa Hanya in Tokyo in 1974 (Maldague, 1976, p.217). The structure of the test was identical in all respects bar one; two of Hanya's alternatives, 'Coming of a glacial age' and 'Invasion of men from outer space' were replaced by 'General degradation of the environment'. The Japanese questions were felt to be inappropriate to the South African situation and inapplicable to the sample group. Thus, although not directly comparable because of age and minor structural differences, the

results are nevertheless worth at least viewing in relation to each other.

266 pupils responded to question D4, of whom 57 (21,43%) marked YES and 209 (78,57%) NO, a breakdown by standard groupings being given in Table 8.28. According to these returns Afrikaans and rural pupils are significantly less optimistic than their sub-group counterparts, but there is little difference between males and females, which is in contrast to the Japanese result shown in Table 8.29a. Of the 57 'YES' pupils, 43 were able to rank the factors satisfactorily, detailed results of which are shown in Table 8.30. Some pupils ranked only one or two factors, while five added 'the day of judgement' and one 'destruction of the ozone layer'. Consolidated results by standard grouping, showing ranked order of importance are presented in Table 8.31.

TABLE 8.28    RESPONSES TO QUESTION D4 (1st part) (%N/n)

RESPONSE	TOTAL	U	R	♂	♀	A	E	n
YES	21,43	14,91	31,43	22,22	20,35	27,10	17,61	57
NO	78,57	85,09	68,57	77,78	79,65	72,90	82,39	209
n	266	161	105	153	113	107	159	

N = 266

Comparisons of these figures with the Japanese data displayed in Table 8.29b show that apart from the anomaly of 'nuclear war' Japanese pupils were far more concerned about both pollution and the depletion of natural resources than were the South Africans. The Natal pupils were by contrast more concerned about disease and food shortages than the Japanese. These opinions reflect to a high degree the problems and potential problems facing each of these countries and in both cases indicate a reasonably informed opinion on the part of pupils. Finally, as shown in Tables 8.29 and 8.31, there were minor differences of opinion between males and females in both samples. In the Natal sample there were minimal differences between urban and rural or Afrikaans and English speaking sub-groups.

TABLE 8.29 DATA FROM JAPANESE STUDY (HANYA, 1974) COMPARABLE TO QUESTION D4

a. DISTRIBUTION OF ANSWERS TO 'DO YOU THINK THAT MANKIND WILL PERISH IN YOUR LIFETIME?'

	YES	NO	NO ANSWER
TOTAL	47,80	51,80	0,50
Male	55,00	44,00	1,00
Female	40,50	59,50	0,00

Source: Maldague, 1976, p. 217

b. RANKED ORDER OF RESPONSES TO LISTED FACTORS

FACTOR	♂	♀	AVERAGE	SOUTH AFRICAN COMPARISON
Outbreak of a nuclear war	6	6	6	1
Coming of a glacial age	2	3	2/3	
Air and water pollution	1	1	1	3
Invasion of men from outer space	4	5	4/5	
Food shortage	5	4	5/4	2
Drain of natural resources	3	2	3/2	5
Spread of an incurable disease	7	7	7	4

Source: Compiled from Maldague, 1976, p.217 and p.218

TABLE 8.30 FREQUENCY OF RANKED RESPONSES TO QUESTION D4

RESPONSE	FREQUENCY OF RANKED ORDERS							OVERALL RANKED ORDER
	1	2	3	4	5	6	7	
Outbreak of nuclear war	29	4	1	0	1	5		1
Food shortage	6	16	8	4	4	1		2
Air and water pollution	0	8	15	9	4	2		3
Spread of an incurable disease	0	8	4	9	5	8	2	4
Drain on natural resources	2	1	7	10	9	8	1	5
General environmental degradation	2	2	3	5	14	12		6
'Other' reasons	3	1						7

N = 266

TABLE 8.31 CONSOLIDATED RANKING RESULTS OF QUESTION D4 BY STANDARD GROUPING

FACTOR	TOTAL	U	R	♂	♀	A	E
Outbreak of nuclear war	1	1	1	1	2	1	1
Food shortage	2	2	2	2	1	2	2
Air and water pollution	3	3	3	3	3	3	3
Spread of an incurable disease	4	4	4	4	5	4	4
Drain on natural resources	5	5	5	5	4	5	5
General environmental degradation	6	6	6	6	6	5	6
'Other' reasons	7	7	7	7	7	7	7

N = 266

Question D6 aimed to compare pupils' views of the future for South Africa with that of the world. The question was:

What do you think the future of wild animals, wild birds and wild places is in:

	WORLD	S.A.
Excellent		
Good		
A 50-50 chance		
No real hope		
No future		

(AVI: "You should here have only one tick in the world column and one in the S.A. column.")

The world column was answered by 283 pupils and the South African column by 290. Results, by standard grouping, are given in Table 8.32, from which a clear pattern emerges. In terms of the total figures and for all sub-groups, South Africa is viewed in a much more optimistic light than the world as a whole. This occurs at all levels of rating. Whereas just over 50% of the sample rate the world with a '50-50' chance, a slightly higher proportion rate South Africa's chances as 'good'. Among the sub-groupings, South Africa received three 'no future' ratings in the lowest category, and the world three 'no future' ratings in the highest category.

Sub-group differences of opinion are generally more divided on South Africa than on the world, the biggest differences being displayed between

TABLE 8.32    RESPONSES TO QUESTION D6 BY STANDARD GROUPING EXPRESSED AS % OF n

RATING	TOTAL		U		R		♂		♀		A		E	
	WORLD	S.A.	W	S.A.	W	S.A.	W	S.A.	W	S.A.	W	S.A.	W	S.A.
EXCELLENT	0,35	8,28	0,55	7,03	0,00	10,48	0,69	8,22	0,00	8,33	0,00	13,39	0,57	5,06
GOOD	14,13	59,31	13,89	58,92	14,56	60,00	11,11	55,48	17,27	63,19	15,89	56,25	13,07	61,23
50 - 50	55,12	29,66	54,44	30,27	56,31	28,57	54,17	34,93	56,12	24,31	40,19	25,00	64,20	32,58
NO REAL HOPE	25,80	2,41	27,78	3,24	22,33	0,95	27,08	1,37	24,46	3,47	36,45	4,46	19,32	1,12
NO FUTURE	4,59	0,34	3,33	0,54	6,80	0,00	6,94	0,00	2,16	0,69	7,48	0,89	2,84	0,00
n	283	290	180	185	103	105	144	146	139	144	107	112	176	178

N = 283



males and females, and between Afrikaans and English speaking pupils; urban/rural differences are small. Rural, female and Afrikaans speaking pupils are noticeably more optimistic about South Africa than are their sub-group counterparts. In the case of the world, rural, female and English speaking pupils are marginally more optimistic than their sub-group counterparts, which is in contradiction to the results of question D4. There is no apparent reason for this other than the possibilities arising from the different phrasing and content of the questions.

The question as to why South Africa is viewed more optimistically raises a hornet's nest of possibilities which do not fall within the scope of the present investigation. They would for example include factors such as comparative levels of environmental knowledge, both factual and conceptual, an interplay of patriotic and xenophobic emotions linked to specific media influences, and the fact that superficially at least, South Africa may well offer a better future in terms of the aspects enquired into.

Whether the levels of optimism and pessimism expressed in these two questions are necessarily good or bad, encouraging or discouraging, is both a difficult and often meaningless point to pursue. Not only do individual and group dispositions fluctuate, but in conservation terms both optimism and pessimism may have positive as well as negative effects. Kelly (1977, p.61) summed up the situation when, at a conference on 'Key Issues of the Future in Environmental Education', he declared:

"I see little virtue in an optimism that ignores reality, but if it assumes that problems can be understood, tackled and ameliorated, if not always solved, then, it seems to me, it is inestimably more valuable than pessimism. Some would argue that the pessimists alert us to the problems, and of course, there is some truth in this. Paradoxically, in doing so, they are being positive and I would not quarrel with them in this respect. It is when despair creeps in that pessimism is self-defeating. Our aim should be to avoid this and create a positive attitude from which to obtain the motivation of judgements in environmental discussion."

The relationship of optimism or pessimism to knowledge on an issue is an interesting one about which no work appears to have been done in environmental education. In the present context if the CAWT scores of pupils giving YES and NO answers to question D4 are compared, the differences

are statistically insignificant — 53,31% and 56,49% respectively. Similarly if the CAWT scores for each of the ten groups comprising the total columns of Table 8.32 are computed, no pattern between optimism/pessimism and the scores is evident so that for the present sample at least, it may be safely concluded that such a relationship does not exist.

### 8.8 Preliminary conclusions

Evidence put forward in this chapter has pointed primarily to the importance of the relationship between environmental perception and environmental education — an interdependence about which little as yet appears to be known. In seeking patterns of relationships we have at best been able to identify and point to the existence of isolated islands in a complex archipelago of concepts and influences. Preliminary explorations of interlinking factors have raised a myriad of new questions, not least of which concerns the relationship of environmental and conservation attitudes to experiences of the type examined in Chapter 6. Indisputable evidence of the existence of this relationship has however been led.

Apart from pointing to directions of potentially fruitful pursuits, environmental attitudes have been shown to be compounded of such fragmented and diverse elements as rationality, knowledge, a sense of the common good and unabashed self-interest, all with varying inputs according to circumstances. Possibly however, the most important single point which has been established is that in looking at man's perception of the use of the environment, attention must be given to factors that determine differences in individual response. It is around such issues that environmental education will have to be developed.

## CHAPTER 9    CONCLUSIONS

### 9.1 Evaluation of the study

The study was prompted by the conceptually confused state of environmental education and awareness in South Africa, the paucity of concrete knowledge on existing levels of environmental and conservation awareness, the wide diversity which exists in the practice of environmental and conservation education and the almost total absence of meaningful evaluation of courses and programmes which do exist. In conclusion it is appropriate to assess the extent to which the proposed aims and objectives of this research project have been achieved, as these reflect directly upon any deductions to be drawn.

The primary aim was to contribute towards the creation of a body of baseline data on environmental and conservation education. Questions were posed as to how environmentally aware different sections of the South African population are and an attempt was made to quantify the 'awareness level' of a specific section of that population viz. the target group as defined. Such an approach, it was considered, would not only provide data concerning the target group itself, but would also provide a potential model for further modification, and a comparative yardstick for studies of a similar nature.

Both the primary aim and its associated objectives are considered to have been achieved. A substantial body of baseline data has been produced and many problems in the gathering of this data have been brought to light. Patterns and relationships between different subsets of data have emerged and there is a wealth of material for future comparative analyses. A simple model has been developed wherein measured values of awareness are compared with both individual and collective experiential factors. To place these achievements in perspective however, they are subject to a number of qualifying statements and factors. As stated at the outset, the research programme was essentially exploratory and as a consequence the results achieved were often either tentative or conditional upon factors which are subject to further question or modification. Patterns and relationships, while clear in many instances, are ambiguous or unclear on

other occasions, thus suggesting the need for further investigation. Finally, the experimental model, having been established, is now subject to further refinement and sophistication.

Apart from empirical data provided by the survey, much information has been synthesized and presented regarding the framework and ethos within which environmental and conservation education operates — a necessary addition to existing perspectives in South Africa. Concepts and terminology were analysed with particular reference to South Africa and the evolution of theory and practice was traced in outline both internationally and locally. Attention was drawn to the nature, and in some cases the potential effectiveness or limitations, of local programmes and courses, a point underscored by some of the patterns emerging from the CAWT. It was also indicated that the structure and content of courses were sometimes determined as much by philosophical, religious and political considerations as on ecological or educational grounds. While there is sometimes a reasonable level of clarity regarding purpose and intention, content often appears to be based on intuition and apparent significance, rather than on careful consideration or the realistic needs of the recipients. In fairness however, very little is currently known about what these needs are. Evaluation of the success or failure of activities, almost without exception, amounts to little more than subjective intuitive staff reactions to pupils' responses.

As far as Natal is concerned — the specific area where the research was conducted — the researcher was able, over a period of observation of several years, to find little evidence of the conscious propagation of environmental awareness in White schools either at primary or at secondary level. While certain activities such as annual conservation symposia did, and do, occur on a regional and provincial basis, and many schools have outdoor or wildlife clubs, the actual number of pupils who become involved in these activities is a very small proportion of the total. Subject-related field studies and general excursions take place on a basis which varies from school to school, and depends largely upon the enthusiasm of the school heads and teaching staff for such activities. The quality and level at which these outings are conducted are also a function of teacher training. Webster (1979, p.50), for example, observes that

"... it is doubtful whether the teacher education programme for the junior and senior primary teachers allows for the development of sufficient skill and confidence in the subject to take pupils into the field for more than simple observational purposes."

This is a point pursued in section 9.2.4 below. It appears from observation that most field studies at secondary schools are closely subject orientated and that there is little evidence of the inter-disciplinary or cross-curricular work of the sort to stimulate wider environmental awareness. Where general purpose excursions are undertaken they appear to be largely unstructured and mainly of the passive 'tour' variety rather than of a pupil activity or investigative nature. Even where schools go on conservation orientated courses, a variety of which are offered in the province, the content of these is, in the opinion of the researcher, often open to question. This is particularly the case in relation to their potential long term impact. The present cost-to-benefit ratio of such activities is another point to be considered and to which later reference will be made.

The question was asked as to why this situation should exist and how the White education system in Natal stood in relation to the rest of South Africa and the world. What, if anything, could be learnt and what might be transferable to the local situation, within the constraints of the existing education system? While the answers to these questions were not the primary nor even subsidiary purpose of the survey, pointers to some of them are to be found in the data accumulated. Before such questions can be fully answered, a prime necessity is to develop an empirical and quantifiable measure of the total situation relating to environmental and conservation awareness. This would replace the vague and amorphous notions generally existing at present. The current survey has gone only a small part of the way towards achieving this goal.

The secondary aim of the study, to devise and test a technique for measuring conservation awareness and to relate the results to the background experience of pupils, formed the central core of the research undertaken. The development and application of the CAWT achieved the first goal of being able to allocate a statistical value to conservation awareness. The exercise showed however that the test itself was not

without need of further modification both in terms of content and, to a lesser degree, application. These aspects, discussed in Chapters 5 and 7, and seen in relation to the constraints of construction, do not however detract from the value of the principles established.

The second goal of relating issues to past experiences was, although achieved in principle, ambiguous in terms of actual results. While there was a high correlation between measured awareness and certain types of experience, overall correlation between the IBE as constructed and the CAWT was low. Reasons for this, particularly those relating to the content and construction of the IBE, have already been discussed in Chapters 6 and 7, but it is pertinent to re-emphasise here the highly experimental nature of the IBE. What is indicated by the results is not a rejection of the principle upon which it is based, but a modification of structure and content. Measured awareness has been shown to be linked to certain causal factors, giving an indication both of how children might become environmentally aware and what kind of environmental experiences may be evaluated meaningfully.

Pupils' perceptions of selected environmental issues, and of themselves and others in relation to those issues, were, within the limitations set by the study, successfully ascertained. A substantial body of data on attitudes to the environment was obtained, some of which could be related to the results of the CAWT and individual items comprising the IBE. As noted in Chapter 8, indications of a relationship between environmental perception and environmental education have emerged — a result which, if pursued further, is of potentially significant value in the design and implementation of environmental education programmes. Apart from some problems of question design and the data shortcomings arising from the limited nature of the undertaking, this aspect of the research is considered to have been successfully achieved.

Turning to evaluation of the questionnaire as a research tool, it is on the whole considered to have served the purpose for which it was designed. However, as with many other aspects of the study, hindsight has pointed to several areas where improvement might or should be effected. The most important of these, already noted in the text, centre around wider and more

D4 Dink jy dat die mensdom in jou leeftyd sal vergaan? 

JA	NEE
----	-----

As jou antwoord "Ja" was, gradeer die volgende van 1 tot 6 in orde van waarskynlikheid:

- Uitbreek van kernoorlog
  - Lug- en waterbesoedeling
  - Voedseltekort
  - Uitputting van natuurhulpbronne
  - Verspreiding van ongeneeslike siekte
  - Algemene besoedeling en vernietiging van die omgewing
- |  |
|--|
|  |
|  |
|  |
|  |
|  |
|  |

D5 In volgorde van belangrikheid vir die mensdom se toekomstige welsyn en geluk, voltooi die tabel hieronder deur een van die volgende in te vul (slegs syfer):

- 1 baie belangrik
- 2 belangrik
- 3 van geen belang nie
- 0 geen mening

- Beheer van bevolkingsgroei
- Beheer van besoedeling
- Versigtiger gebruik van hulpbronne & hergebruik
- Bewaring van wild & natuurskone plekke
- Die verbetering van boerderymetodes & bestuur

Wêreld	S.A.

D6 Wat dink jy is die toekoms van wildediere, wildevoëls en die natuurskoon in:

- Uitstekend
- Goed
- Gelyke kans
- Nie baie hoop nie
- Geen toekoms

Wêreld	S.A.

b. Administration schedule

(Planned time allocation per question is given in seconds. In practice this varied slightly with different classes).

- I am going to ask you to answer some questions concerning nature conservation. This is entirely voluntary and you do not have to participate if you do not wish to. If you do participate, you may leave out any individual questions which you do not wish to answer.
- The purpose of the questionnaire is to find out the opinions of Standard 9 pupils on several aspects of nature conservation. It is anonymous and I'd like you to answer as honestly as you can. You are entitled to your opinions whatever they are and there are no right or wrong answers.
- Wherever there is a box place a tick (✓) in the appropriate place unless told otherwise. Write ✓ on chalkboard.
- Where there is no box, answer in single words or short sentences.
- Once you have made an answer do not try to go back and change it as we will be going through the questionnaire very rapidly and it will not help if you fall behind. Do not go on to a question until you have been told to. If you have not answered by the time the next question is asked, leave it and go onto the next one. Do not scratch out or attempt to delete a question once you've answered it.
- The questionnaire is divided into four sections, called A, B, C and D, each with its own questions. Follow me through each question.

ANY QUESTIONS? CHECK THAT ALL PUPILS HAVE PENS/PENCILS.

Now look at Question A1.

Question A1. AVI: Tick which is appropriate and write in your age at the 1st August this year. 10 secs.



Question A2. **AVI:** Write in your father's present occupation and your mother's trained occupation even if she is a housewife at present. If she has no training or occupation write NIL. **NIL ON CHALKBOARD.** Now, whatever else you have written, if your mother is presently a housewife write an H **H ON CHALKBOARD** in the red square.

**40 secs.**

Question A3. Complete.

**5 secs.**

Question A4. **AVI:** If you're a boarder write down your home town. If you live on a farm write down 'farm' with the nearest town in brackets.

**20 secs.**

Question A5. **AVI:** If this is different from your present home town, give the place name e.g. 'Rhodesia', 'on a farm' or 'Pretoria'. If you can remember put the year(s) you lived at each place behind it in brackets.

**30 secs.**

Question A6. **AVI:** Complete the white column if you are at present a member. **PAUSE** If you were, but no longer are, tick the red column. Write in any other such organisations which you have belonged to in the past or belong to now, underneath the question.

**45 secs.**

Questions A7. **AVI:** Complete the white column. **PAUSE** If you can remember the year or years you went, write it in the two red columns, If you have been on a similar type of course not listed, write it underneath the question.

**60 secs.**

Question A8. Complete.

**40 secs.**

Question A9. **AVI:** This refers to anything you've marked or written in Question A8.

**25 secs.**

Question A10. Complete.

**15 secs.**

Question A11. Complete.

**15 secs.**

Question A12. **AVI:** Write underneath this list any other magazines on nature conservation which you regularly read. **25 secs.**

Question A13. Complete. **25 secs.**

Question A14. **AVI:** Note that we are referring to books and not magazines. **15 secs.**

Question A15. Complete. **25 secs.**

Now go to Question B1 and complete it. **60 secs.**

I am now going to read the next 27 questions out to you. You are to mark your answers in the space indicated on your answer sheet. I will read each question only twice, so listen carefully. **PAUSE** Ready?

Question B2: What is the normal food eaten by;  
Baboons?  
Antelope? **50 secs.**

Question B3: Do you think the hyena serves any useful purpose?  
If you said 'Yes' then explain what. **15 secs.**  
**30 secs.**

Question B4: Do you think it would matter if the South African Black Eagle became extinct?  
Give reasons for your answer. **15 secs.**  
**30 secs.**

Question B5: If you had the opportunity to save a baby springbuck from a leopard without any danger to yourself, would you do it? **15 secs.**  
Give reasons for your answer. **30 secs.**  
Would you rescue a rodent about to be caught by an owl? **15 secs.**

Question B6: Do you think it is as important to protect the small mammals as the large ones?  
Why? **15 secs.**  
**30 secs.**

- Question B7: Would you support a campaign to permanently exterminate all caterpillars in South Africa? 15 secs.  
Give reasons for your answer. 30 secs.
- Question B8: Do you think it matters if pine trees grow in our nature reserves? AVI: There is no objection to the commercial cultivation of pines. 15 secs.  
Why? 30 secs.
- Question B9: Do you think it is necessary to have careful management and care of South Africa's different types of vegetation? 15 secs.  
Why? 30 secs.
- Question B10: Should we avoid using dead wood for firewood in national parks, nature reserves and wild places? 15 secs.  
Give reasons for your answer. 30 secs.
- Question B11: Do you think it is necessary for city streets to have trees in them? 15 secs.  
Why? 30 secs.
- Question B12: Do you think that wild birds have a function in cities? 15 secs.  
Explain your answer. 30 secs.
- Question C1: Do you approve of hunting? 10 secs.
- Question C2: Do you approve of hunting on a sustained yield basis? 65 secs.  
Why?  
AVI: 'Sustained yield' means hunting in such a way that the actual number of animals is not reduced over a long period of time. Each year only a number roughly equivalent to the previous years' increase is hunted so that one has an annual 'crop'.

Question C3: Would you get any pleasure or thrill out of visiting wild or natural places?

10 secs.

Explain.

30 secs.

**AVI:** If you've never visited such a place, do not answer the question.

Question C4: Are rules and regulations for Man necessary in the wild?

10 secs.

Why?

30 secs.

Question C5: Do you think people should make some contribution towards nature and wildlife conservation?

10 secs.

Question C6: What sort of contribution do you think a person such as yourself can make?

30 secs.

Question C7: Do you think that a man caught poaching for food in a game reserve should be:

severely punished?

mildly punished?

not punished at all?

10 secs.

Question C8: Do you think that before any sort of development can take place an environmental impact study should be done to ascertain what the land is best suited for?

60 secs.

**AVI:** An environmental impact study is a careful and detailed assessment of the potential influence which any development might have upon an area or region. It is carried out before any development begins and may influence all decisions concerning that development. Its recommendations will usually be favourable to some people and unfavourable to others.

Question C9: Do you think your home town has enough parks and open or wild spaces in it?

10 secs.

Question C10: If you had not eaten for 5 days and had the opportunity of trapping a small antelope, would you do it?

10 secs.

Question C11: Do you think that we in South Africa are doing enough for nature conservation? 10 secs.

Question C12: Do you think that we are doing enough in educating people about nature conservation and the reasons for it? 10 secs.

Question C13: Do you have television at home? 10 secs.

Do you think that television has made you more aware of the complex problems of nature conservation? 10 secs.

Question C14: If you knew you would not get caught breaking a rule in a game reserve, might you break it if you could gain something from it such as a good photograph? 10 secs.

Question C15: Do you approve of pellet guns? 10 secs.  
Explain your answer. 30 secs.

Question C16: List some of the things which you have done for wildlife or nature conservation. 30 secs.

We now go back to answering questions printed on your questionnaire.

Question C17. AVI: Keep your answers to one word or a short phrase. 30 secs.

Question C18. AVI: Keep your answers to one word or a short phrase. 30 secs.

Question C19. AVI: Keep your answers to one word or a short phrase. 50 secs.

Question C20. AVI: Complete. 25 secs.

Question C21. AVI: Complete. 60 secs.

Question C22. AVI: Keep your answers to one word or a short phrase. 30 secs.

Question C23. AVI: Keep your answers to one word or a short phrase. 30 secs.

- Question D1. **AVI:** Say if you think there are no such problems. **60 secs.**
- Question D2. **AVI:** First complete the white column by ticking only those which you consider appropriate. **PAUSE** Now in the red column rank all eight points in what you would consider the order of likelihood e.g. 1 = most likely, 8 = least likely. In answer to the question "What does rank mean?" the answer given was: "Write in the order of importance from 1 to 8." **60 secs.**
- Question D3. **AVI:** Tick only the appropriate points here. Do not rank. **60 secs.**
- Question D4. **AVI:** Tick the YES/NO choice, but only rank if you answered YES. If you said NO, then rest for a minute. **40 secs.**
- Question D5. **AVI:** There should be an answer in each block in this question. **60 secs.**
- Question D6. **AVI:** You should here have only one tick in the world column and one in the SA column. **50 secs.**

Total planned time for administration of questionnaire = 1 980 seconds  
(33 minutes).

Identical instructions were given in Afrikaans. Here follow the Afrikaans equivalents of the verbally administered questions.

- Vraag B2: Watter kos eet 'n bobbejaan gewoonlik?  
Watter kos eet 'n wildsbok gewoonlik?
- Vraag B3: Dink jy dat die hiëna enige goeie doel dien?  
Verduidelik.
- Vraag B4: Dink jy dit sal saak maak as die Suid-Afrikaanse Witkruisarend  
uitgewis word?  
Gee redes vir jou antwoord.
- Vraag B5: As jy die geleentheid gehad het om 'n springboklammetjie uit die  
kloue van 'n luiperd te red sonder dat jy aan gevaar blootgestel  
word, sou jy dit doen?  
Gee redes vir jou antwoord.  
Sou jy 'n knaagdier red wat op die punt staan om deur 'n uil  
gevang te word?
- Vraag B6: Dink jy dat dit net so belangrik is om die klein soogdiere as  
die grotes te beskerm?  
Gee redes vir jou antwoord.
- Vraag B7: Sou jy 'n veldtog ondersteun wat die permanente uitwissing van  
alle ruspes in Suid-Afrika ten doel het?  
Gee redes vir jou antwoord.
- Vraag B8: Dink jy dat dit saak maak as dennebome in ons natuurreservate  
groei?  
Waarom?
- Vraag B9: Dink jy dat dit belangrik is dat verskillende Suid-Afrikaanse  
planttipes versigtig beheer en bewaar moet word?  
Waarom?
- Vraag B10: Is dit 'n goeie idee om die gebruik van droë houtstompe in  
nasionale parke, natuurreservate en plekke van ongeskonde  
natuurskoon vir vuurmaak te vermy?  
Gee redes vir jou antwoord.

Vraag B11: Dink jy dit is noodsaaklik dat daar bome langs strate in stede moet wees?

Waarom?

Vraag B12: Dink jy dat wilde voëls in die stad enige funksie het?

Gee redes vir jou antwoord.

Vraag C1: Keur jy jag goed?

Vraag C2: Keur jy dit goed dat mens kan jag volgens die beginsel van volgehoue oes?

Waarom?

Vraag C3: Sal jy enige plesier of opwinding ervaar tydens 'n besoek aan 'n plek met natuurskoon?

Verduidelik.

Vraag C4: Is jy van mening dat reëls en regulasies vir die mens noodsaaklik is as hy in die natuurskoon verkeer?

Gee redes vir jou antwoord.

Vraag C5: Is jy van mening dat mense enige bydrae tot natuurbewaring behoort te maak?

Vraag C6: Watter soort bydrae kan iemand soos jy lewer?

Vraag C7: Moet 'n man wat wild vir kos in 'n reservaat steel of doodmaak: swaar gestraf word?

lig gestraf word?

gladnie gestraf word nie?

Vraag C8: Is jy van mening dat 'n omgewingsgebruikstudie eers gemaak moet word om vas te stel waarvoor die omgewing die geskikste is voordat enige soort ontwikkeling kan ontstaan?

Vraag C9: Dink jy dat jou tuisdorp genoeg parke, oop ruimtes en plekke met natuurskoon het?



- Vraag C10: As jy vir 5 dae nie geëet het nie en jy het die kans om 'n klein wildsbok te vang, sal jy dit doen?
- Vraag C11: Dink jy dat ons in Suid-Afrika genoeg vir natuurbewaring doen?
- Vraag C12: Dink jy dat ons Suid-Afrikaners genoeg doen om mense bewus te maak van natuurbewaring en die redes daarvoor?
- Vraag C13: Het julle beeldradio by die huis?  
Dink jy dat die beeldradio jou meer bewus gemaak het van die ingewikkelde probleme van natuurbewaring?
- Vraag C14: As jy weet jy nie gevang sal word nie, sal jy 'n reël in 'n wildduin oortree as jy daarby iets kan baat soos byvoorbeeld om 'n goeie foto te kry?
- Vraag C15: Keur jy die besit van windbukse goed?  
Verduidelik.
- Vraag C16: Noem iets wat jy al vir natuurbewaring gedoen het.

Accuse Not Nature, she hath  
done her part: Do thou but thine!  
John Milton.

comprehensive coverage in terms of content and a more varied employment of questioning techniques. Innovations in the latter respect might include, for example, recorded verbal response, picture recognition and problem solution.

The majority of questions and responses were shown to be both valid and reliable, and in part confirmed the assumption concerning 'honesty' made in Chapter 1. In cases where this was not so, the matter was discussed in the text. The different types of questions employed varied in the success with which they elicited the information sought. In general, those which were more complex in structure were less successful, particularly if ranking or detailed recall (e.g. dates) was required. Open-ended and controlled responses were equally valuable and complemented each other to a very high degree, while the method of seeking contradictory responses and the related scrambling of questions is considered to have been very successful.

Where it was relevant, evaluation of the assumptions upon which the study was based have been carried out in situ. It is worth noting that although the researcher remains convinced of the ultimate assumption of environmental education i.e. that it is worthwhile, some prominent writers in the field (Carson, 1980; Storm, 1980) have recently begun to question this. In many parts of the world, the researcher would continue to argue, environmental education remains at least part of the process by which deterioration of the environment can be retarded or reversed.

The first hypothesis postulated in Chapter 1 (section 1.4a on page 6), has already been discussed and may be described as conditionally accepted in principle. However there is a need for improved measuring techniques and for re-assessment when individual items of experience are compared with the CAWT. The second hypothesis (section 1.4b, p.7), has been dealt with in Chapters 5,6 and 7 and has also been conditionally accepted, subject to validation by further measurement and a review of some of the underlying assumptions, relating to pupils' background experiences, upon which it is based. The third hypothesis (section 1.4c, p.7), thus far only alluded to, is dealt with later in this chapter.

In summary, the study is considered to have achieved its aims and objectives, although not always in the positive or expected sense. In addition, many problem areas have been exposed; in some cases the answers or pointers to them are evident, while in other cases further research is required before any conclusions can be suggested. As Kelly (1977, p.61) observed:

"... the aim of environmental education should be to heighten our continuing personal and public awareness of environmental issues. It is, of course, true that we cannot always agree on the answers to environmental problems; that, in some cases, we don't know enough to get anywhere near an answer. This is not so surprising. The current concern for the environment is of relative [sic] short duration."

One clear factor to emerge however, is that, because of the nature and complexity of the issue, future investigation should be, where possible, computer based. This will facilitate the use of such techniques as multivariate analyses — an inevitable step if full understanding is to be achieved.

## 9.2 Considerations for the development of environmental education in South Africa

### 9.2.1 Some general considerations

The researcher's study of and involvement in environmental and conservation education in recent years has, amongst other things, led to the conclusion that, for the foreseeable future at least, any attempts to, or hopes of, achieving environmental awareness in South Africa are likely to be influenced by three groups of factors:

- a. The reality of social, political and economic circumstances. Environmentalism is as much a social and political activity as it is an educational one, and to be affective must be rooted in reality. Ideas and ideals must by necessity be tailored to what is possible, probable or permissible.
- b. Cost-to-benefit considerations. Those who allow or support environmental programmes, courses or efforts in financial, social or other ways are increasingly likely to ask whether optimum cost-to-benefit ratios are being achieved, not only in absolute terms, but relative to alternative demands both from within and outside

of the environmental movement.

- c. Environmental education, linked as it is to advances and progress in other environmental 'fields', is itself a dynamic process in which not only are the precise aims, purpose and content in a continual state of flux, but which may be approached in a variety of ways.

These factors are inextricably interwoven with the results of the study, which should be seen within this contextual framework.

The empirical results of the study, insofar as the relationship between conservation awareness and past experiences is concerned, may be reduced to three closely related areas of concern:

- a. The issue of direct participation in environmental activities — the participation factor;
- b. Where and in what context environmental education should take place — the contextual factor;
- c. The role of the school teacher in promoting environmental awareness.

Linking these considerations together is the whole question of approach towards the creation, development and achievement of environmental and conservation awareness. Viewed on a macrocosmic scale, approaches range on one hand from total commitment to a fundamental review of basic values and intense personal involvement, to an objective, non-involved (in the personal sense) academic position on the other. It may vary from attitudes embracing a high degree of prescription, and often proscription, to those rooted in an abhorrence of clearly defined objectives, a disdain for purposeful planning and a disregard for structured activity.

Most approaches would fall somewhere between such extremes. Indeed, if one could conceive of a concerted effort in environmental education, one would hope for far too many results to allow it to be dominated by a single set of ideas or teaching method. It could also be argued that to have any possibility of success in a multi-cultural and multi-value society like South Africa, a flexible approach is not only desirable, but absolutely necessary. On the other hand, there is a fine line between the benefits of eclecticism and the wasted effort inherent in an approach devoid of basic principles and clear direction.

An examination of some of the papers presented at the 1980 UNISA Workshop on Outdoor Education would indicate that at times relatively extreme approaches have been advocated in South Africa. The main danger does not lie so much in the possibility of such views and approaches gaining widespread adherence, but in the seeds of doubt and mistrust which are sown when they are advocated for cultural groups other than for those for whom the spokesmen are entitled to speak. Such a situation can lead to attitudes counter-productive to the cause of achieving environmental awareness, and consequently to real or perceived unfavourable cost-to-benefit ratios.

In the same context attention might be drawn to South Africa's relative isolation from the mainstream of international thought in environmental education, although this does not necessarily extend to all aspects of the situation and is minimal in related areas such as the field practice of conservation. Isolation may, up to a point, encourage innovation and self-reliance, but must be seen against a background of the international nature and complexity of environmental problems and issues. South Africans will do well to bear in mind that in many parts of the world, including those with which South Africa has no contact, conservationists and educationists are attempting to halt or even turn back what the 1975 Belgrade Charter described as a situation of

"... increasing deterioration of the physical environment in some forms on a worldwide scale ... [a condition which] ... affects all of humanity." (Hughes-Evans, 1977, p.69).

No country or group of people can remain unaffected by environmental and conservation battles being waged in other parts of the world. Apart from the obvious influences of pesticides and pollution, there will be no escape from more insidious factors such as the regional, and possibly world-wide, modification of climate which is now only beginning to attract attention. Zimbabwe is a case in point. The use of DDT in that country is 52 times the recommended WHO level (as reported in the Zimbabwe Science News, November 1980; SABC-TV, 5/9/1981 and widely in the Zimbabwean press).

Having thus analysed some aspects of the approach to environmental education, attention can now be given, within this context, to considerations arising from the research results, the three areas of concern listed above forming the basis for discussion.

### 9.2.2 The participation factor

The question of the relative significance of active participation and direct personal experience, as factors in education in general, is not new, having been accorded varying degrees of importance throughout the history of western educational writing, even though often couched in such terms as 'actuality' or 'discovery'. With the emergence of environmental education as a distinct field of concern within the broader educational sphere, it was therefore natural that the question would be re-examined in terms of specific aims and goals. The result is a widespread acceptance of the participation factor in environmental education (Wheatley & Coon, 1974; Martin & Wheeler, 1975; Wheeler & Waites, 1976; Carson, 1978; and numerous publications of the US Department of Agriculture).

More significantly writers such as Herbert (1976) and Grant (1978) have built a strong case around the issue, relating active participation to cognitive development, attitude formation and the development of skills and powers of observation. Shortle (1976, p.25) argues that "direct field experience also may be quite critical for attitudinal change", while the Schools Council (1972a, 1972b) has elucidated upon skill development inherent in environmental studies. Merrick (1972), Mitchell (1972) and Whitburn (1972) have drawn attention to the relationship of environmental studies to language, art and music respectively.

While it is impossible here to summarise the great wealth and complexity of material available on the development of attitudes and the way in which they may affect learning, what Shortle (1976, p.26) calls 'features of attitudes', insofar as they have relevance to environmental education, are worth quoting in full. Based partly on the work of Jahoda & Warren (1966), whose operational definition of an attitude was accepted in Chapter 1, they are relevant not only to much of what has been discussed in the study, but are also pertinent to the planning of participatory experiences:

- "1. They are psychological sets or predispositions to respond to objects or experiences in certain ways (behaviourally, cognitively and affectively).
2. Attitudes are organised, internally consistent, and coherent in structure.
3. They carry an object reference, or are directed towards some thing, some person or some situation.

4. They are more or less enduring, and are not subject to casual ups and downs even though they are open to change through experiences.
5. Attitudes are learned; they are not innate.
6. They cannot be observed directly but must be inferred from actions, statements, perceptual responses, or from some other source.
7. Attitudes involve feelings for/against, favourable/unfavourable, positive/negative.
8. Attitudes are not developed in a behavioural, cognitive or affective vacuum."

To state belief in something is not enough. To be affective, belief must be supported by attitudes based on factual knowledge and understanding and manifest itself in behaviour. As noted by Theophrastus more than 2 000 years ago, a man who is able to identify a tree and understand its value, is less likely to engage in its wilful destruction, than a man who sees it only in terms of satisfying his own needs. The environmentally literate man may argue that its optimum utilization is to leave it where it is.

Most writers on the value of participation as a factor in environmental education are agreed that the concept and praxis of participation should be set in a wider framework of preparation, relevance and follow-up in order to achieve maximum benefit or effect.

#### 9.2.2.1 Pre-participation preparation

Preparation for an environmental activity or series of activities might include a variety of undertakings ranging from mundane tasks and dealing with petty officialdom, to complex organisational planning and thorough academic research. Although the organisational mechanics involved in field work, outdoor experiences, excursions and the like have not been the concern of the present study, and are in any event well known to those who have attempted such undertakings, they must not be underestimated in their importance to the overall success of such endeavours. As O'Riordan (1981, p.12) validly observes:

"To bring a genuine sense of participation into environmentalism is probably the most challenging educational task, and one for which I have no ready answers. One major difficulty here is the restraining influence of the classroom, the timetable and the



curriculum. All these fetters can be broken, but the task of loosening the chains can involve an enormous commitment of time and preparation and much diplomacy with colleagues and the educational authorities."

Of more direct concern in the present context is pre-preparation in the conventional classroom situation where a presumably significant, but as yet undetermined, proportion of environmental experiences are initiated and generated. Much of what is said however, is also applicable to less formal situations such as youth group excursions or family outings.

Ideally pre-participation class activity should provide advance expectations or relevant anchoring ideas for what is to take place both in cognitive and behavioural terms. Such an approach has been found, following Ausubel and Robinson (1969), to facilitate the understanding of controversial material and to be a significant factor in retention. The writer's personal experience concurs with these conclusions. He would however go further, on the basis of informal experimentation conducted, to suggest that pupils' understanding of the reasons for, and resolving of, contradictory and inconsistent values can be made easier. It may be argued for example, that if a pupil with a complacent attitude to atmospheric pollution by industry were required to measure pollution levels in a badly polluted residential area, already knowing the effects of certain pollutants upon human health, that he would be both in a better position to draw a valid conclusion and be more likely to reassess his own values on the subject, than if he had not been prepared for the experience. On this basis a case might even be made for the inclusion of carefully selected 'inconsistency items' as a regular component of participatory experiences. It is important though to stress that the approach to preparation for participation should be flexible in terms of both content and structure, taking into account the characteristics of the groups and individuals concerned.

#### 9.2.2.2 Relevance

Storm's (1972) comment that relevance had become a holy grail for secondary

education is today increasingly applicable to all aspects and levels of education, not least environmental education. With ever competing demands upon the time and energy of even lower primary pupils there appears to be no other alternative. Even Bruner (1971) added the need to examine relevant topics and issues to his original (Bruner, 1960) concept of structural notions. Referring to relevance in aspects of study related to the environment, and the the future quality of life, Carson (1978, p.1), noting problems relating to energy, pollution, population and food supply, concluded that they were all likely to

"... intensify during the lifetime of pupils still at school and will constitute the background to their lives. It is urgent, significant and appropriate that they should form a major element of their education."

By way of contrast Shortle(1976, p.24) noted with some degree of acerbity that

"... much so-called environmental 'education' lacks any real depth examination of the issues and is either simply a pot-pourri of content to be taught or a form of nature romanticism. In such studies the 'noble savage' takes on the form of the 'noble naturalists'."

Relevance is however relative to the perceiver of an issue. It is not an absolute value and cannot afford, if affective behaviour is aimed at, to ignore historic, cultural and racial considerations. No matter how pressing or relevant environmental problems might appear to be, modifications to existing situations can only occur at a rate commensurate with the maximum metamorphosis which a community or society can accommodate without reacting counter-productively. A central concept in any attempted modification of environmental attitudes and values is the relationship between the perspective of individual behaviour and the collective consequences of that behaviour. This is a syndrome often referred to as the 'tragedy of the commons', after the famous essay by Hardin (1968). Understanding of this situation and its relationship to what is perceived as relevant, has wide implications for environmental educators at all levels.

Although little has been written on the direct relationship between relevance and participation in environmental education activities, considerable development has taken place in related disciplines such as geography, history and biology. These sources can be meaningfully tapped to suggest

similar guidelines for environmental education which, if aimed at wide acceptance and application, might include the following:

- a. Environmental educationists should seek clarity on what they mean by the various terms in common use. This seems to take the argument back to Chapter 2, but it is important to reiterate this point as it is closely linked to what is taught or is likely to be taught. In a society such as ours, it is unlikely that agreement will be reached on all issues, and it is not essential that it should be so, provided that there is understanding of and tolerance for alternative viewpoints. To seek absolute conformity in a multi-cultural situation is a waste of time, but the environmental movement in South Africa would benefit substantially from a frank and unconditional re-examination of concepts, aims and goals, even if only with a view to delineating common ground and common cause. The need for flexibility of approach and the relative value of different types of experience might also be analysed and views could be fruitfully exchanged on the whole question, and value, of participatory experience. Ultimately, one would hope that the general haziness which pervades so much of environmental education in South Africa would be replaced by articulate statements subject to rigorous evaluation.
- b. Teachers and environmental educators should be aware both of the importance and limitations of the concept of relevance in environmental experiences. In the front line of environmental education, relevance embraces not only sensitivity towards the real needs and expectations of different groups and the individuals within them, but updated information linked to appropriate methods of approach. The probable response of a hungry child to the concept of antelope preservation would be incredulity and perhaps even anger. A far more relevant approach, both for the survival of the child and the conservation of the antelope as a species, would be via the concept of 'sustained yield'. In planning activities both within the perspective of children, and for the achievement of cognitive objectives, conscious consideration must also be given to the ambience in which the participation will take place. Factors such as the physical nature of the place, who will be there and the context in which it is all happening, are important, although if pre-participatory

work has been adequately carried out, many of the negative effects of this type of situation will be minimised.

- c. An acceptance of the existence and rate of progress of modern technology. As Kelly (1977, p.65) rightly stated:

"Environmental issues are not solved by ignoring technology or advocating its repression. Reasonable answers come through the wise use of appropriate technologies and this requires a comprehensive understanding of them."

The key here is the term 'appropriate' which sets the tone, if not for harmony, for at least some degree of consensus between environmental concerns and technological progress. In some environmental and conservation circles one continues to hear condemnation, sometimes with Luddite fervour, of all forms of technological progress, as though this were the ultimate menace. Where real problems arise, it is pertinent to recall that man is the controller of technology and that modification or change of his attitude is the only real solution.

#### 9.2.2.3 Post-participation follow-up

Potentially equal in importance to pre-participation activity is post-participation follow-up which, following Insko (1967), enhances not only overall comprehension, and thus potentially, changes of attitude, but also leads to greater retention. In the researcher's experience, both these assertions have generally been true. Shortle (1976, p.27) alerts us however to some of the situations which might face the teacher in a follow-up exercise:

- "a. communications may be rejected by questioning, for example, the credibility of the communicator until the original attitude is restored; or,
- b. the attitude may [be] 'fragment[ed]' by the pupil isolating the attitudinal and cognitive components; or, more hopefully,
- c. accommodation will occur through the development of a new consistent, more congruent attitude which will reduce the cognitive-affective inconsistency."

The success or failure of the operation will depend largely upon the training and/or experience of the teacher in handling this kind of exercise — seldom an easy task.

Follow-up work itself might include not only a discussion of the results of activities carried out, but the implications for a solution of problems encountered — a procedure calculated to make any cognitive-affective inconsistency clear. It could also include an evaluation of the activity or course undertaken which could be viewed from several perspectives, including cost-to-benefit considerations, real and potential deficiencies and areas of possible improvement. For many environmental and conservation courses in South Africa, such feedback, even if not entirely welcome, would be highly pertinent.

#### 9.2.2.4 The question of universal participation

Thus far participation as a factor in achieving environmental awareness has been discussed as a model, rather than in terms of universal feasibility. Despite the high proportion of pupils indicating some form of exposure to environmental experiences in Chapter 6, the point was made that by international comparison, the target group appeared to be exceptionally privileged in this respect. On the basis of information quoted in section 6.2.5, p.137 and section 6.2.6, p.143, only the East European countries and the USSR could claim higher proportions of individual pupil participation in environmental experiences. Except for highly centralised educational systems actively pursuing such aims, direct environmental participation by all pupils does not occur, either because it is not wanted, cannot be afforded or, for a myriad of reasons, is not possible. As the South African education system is neither highly centralised, nor actively pursues the aim of creating universal environmental awareness, it falls into the latter category. Alternative methods for the development of environmental awareness must be sought.

A number of considerations are relevant. One must guard against the assumption that active personal participation is the only meaningful, practical, or worse still, cost-effective way of achieving environmental awareness. It is a fact of life, amply borne out by the current research, that attitudes and values are also formed by other and more passive types of experiences such as reading. Nor do experiences occurring 'out of doors', in 'natural areas' or 'beautiful places' have a monopoly on the

creation and development of moral and spiritual relationships to the environment. Symbolic responses may be elicited through a variety of stimuli occurring indoors or in 'built-up areas'. Even within the limited context of nature conservation, there is no certainty that the personal experience factor is important for all children. A problem may arise however, as to whether behaviour will be as affective among those participating to a lesser degree, or whether they will tend toward the non-affective believers referred to earlier. The answer probably lies in the varying needs, as opposed to desires, of individuals.

In the light of what has been stated, the question is asked whether, notwithstanding the indications of the research results, the emphasis on participation within the formal education system should not be on achieving optimum environmental exposure, ideally, but not necessarily participatory, rather than on a hypothetical maximum. Put in other words, does every child want, or need, the same type and level of environmental experience (particularly where cost-to-benefit is relatively high), and consequently, should we not be identifying and selecting, in a cost-to-benefit context, participatory experiences more suited to individuals and circumstances. Criteria of operation would have to be defined and developed, but once the principle was established, that would not necessarily be difficult. It is conceivable that a matrix of different levels of experience (ranging from non- to full participation) could be developed. This could take into account individual needs and constraining circumstances. Ongoing evaluation might then take the form of a continuous cost-benefit analysis in which measured benefits at different levels of participation could become criteria for participation at higher levels. There could still be full freedom to participate at any level on a private basis, but within the formal system the opportunities would be more evenly spread. At present a great deal of effort, in terms of achieving environmental awareness, may be spent on individuals who do not necessarily need it or even want it.

### 9.2.3 The contextual factor

The question of where environmental education should occur has two dimensions often linked in practice; the philosophical framework and the

physical place. Philosophically, there are diverse views on the learning context in which environmental education should occur, but there is a large measure of concurrence on the importance of an integrated approach involving all subject disciplines, even though the practicality of this is sometimes in dispute. It is widely held that no amount of study about environmental concerns that uses an obsolete single discipline approach will be adequate. Pupils subjected to this method are unlikely to be fully able to understand the scope and complexity of the problems, and worse still, may not see themselves as agents of responsibility and change within the situation. Education, it was argued in earlier chapters, is, or should be, amongst other things, a preparation for the future.

Referring to the learning context, environmental education is seen properly by some as being part of established courses at normal educational institutions, by others as a new subject within the regular curriculum, and by yet others as best kept out of the formal education system. Geography and biology are most frequently named as the best suited of current subjects for the development of environmental awareness. Some writers such as Bale et al. (1973), Pritchard (1975) and Wheeler and Waites (1976) provide strong arguments for this. Others such as Wigston (1977) cast the net wider to incorporate nearly all normal school subjects, including mathematics, art and languages. This is a view which also finds regular expression in the pages of the influential Bulletin of Environmental Education where it appears to be editorial policy. Carson (1973, 1977) on the other hand, has argued the case for 'environmental studies' as a separate subject and has guided its implementation as such in parts of the United Kingdom. There, as in the USA, such courses have experienced a mixed degree of success and failure (Cribb, 1981). Even where a strong case can be made for a separate subject, much can however be learnt from subjects such as geography and biology, not least in field techniques.

The present study has suggested that there is no single correct way of approaching environmental education. Because of the present academic load in South African schools, the writer remains totally unconvinced of the desirability of introducing yet another subject which, if examinable, might lose much of its innovative potential and attraction. If, on the other hand, it is non-examinable, it may be relegated to the low status suffered

by other non-examinable subjects such as religious education, music or physical education. Based on the results of the study and the writer's own experiences, it is felt that maximum benefit under present circumstances is most likely to be achieved by modification of existing syllabi in all appropriate subjects, with particular emphasis on geography, biology, history and agriculture. This would have the added advantage of allowing environmental problems and issues to be seen within the wider perspective of other issues arising in these disciplines. Such an approach does not of course preclude extra-curricular environmental education in the form of service or recreation, where the potential for a multi-disciplinary approach is high, and where the model of participation outlined, may, under favourable conditions, be developed to the full.

The view that environmental education programmes are best offered outside of the formal education system is based partly on disillusionment with past efforts and partly on a lack of faith in possible future achievements of the system in this regard. It is most succinctly expressed, not in writing, but in the existence in the western world and, in recent years, in South Africa, of a plethora of environmental education organisations operating independently of, albeit often in co-operation with, formal school systems. A potential advantage of such bodies is the inherent flexibility and freedom which they have to experiment with new ideas and a multi-disciplinary approach. Few in South Africa have however, reached a high level of operation in this respect.

On the matter of suitable physical locations for environmental education, two points raised in Chapter 6 are of concern and require amplification. Firstly, providing principles can be adequately demonstrated, environmental education is nearly always best carried out in the local environment, the value of which is all too infrequently recognised. Elaborate and complex ecosystems are not necessary, except for the most advanced of studies. There is unfortunately a misdirected attitude among many teachers and pupils, by no means confined to South Africa, to evaluate sites in terms of distance from the home base. The further away the site, the more highly it is rated. Any programme aimed at changing such attitudes would not only allow for the wider application of environmental education due to simpler logistics, but also take the element of remoteness out of



environmental issues by bringing them to one's doorstep. Statements such as that made by the Medical Officer of Health in Pietermaritzburg, that pollution of the Umsindusi River "is no worse than any other town's river" (reported in the Natal Witness of 9th January 1979) could then be seen in a clearer perspective. Local ideals, as to what the river 'should' be, could then be compared to real achievements elsewhere, e.g. the cleansing of the River Thames — a well documented project.

The second point, insofar as it related specifically to the study of the natural environment, is the potential for high quality environmental education in school gardens and school nature reserves. This concept is generally very poorly developed in South Africa, despite ample documentation of benefits and success achieved elsewhere (Hawkins & Vinton, 1973; La Hart, 1974; Arnold, 1976, 1978; Kelly, 1978; Sanders, 1980; Caldwell, 1981; TCPA, 1981). An indelible impression has been made on the writer by visits to schools, many in heavily built-up areas, in the United Kingdom and the Netherlands, where school nature reserves, no matter how small, have been developed. In several cases research, of a quality which allowed it to be published, had or was being undertaken by primary school pupils (Arnold, 1978). By contrast, of the 14 secondary schools visited as part of the present study, only two, one private and one provincial, had developed or set aside any semblance of a natural area or reserve, even though several had a rich potential in this respect. Most school grounds were maintained by the provincial gardening services and could, without exaggeration, be described as ecologically sterile. Burton (1975) has listed over 20 educational uses to which such dormant resources could be put, in addition to obvious benefits relating to time and transport costs.

The application and development of these two aspects can be dovetailed with the matrix model suggested, thus allowing wider participation by spreading benefits more evenly in relation to costs. A hierarchy of sites graded for suitability, accessibility and costs might be considered. Within the formal education system, access to, or official support for, visiting distant or high cost sites might even be based partly on criterion achieved at the local or low-cost level.

#### 9.2.4 The role of the teacher

Much of what can be achieved in environmental education at school level depends upon the central figure in nearly all modern education systems, the classroom teacher. Evidence has however been led in previous chapters to suggest that in the portion of the system examined, teachers may not be fulfilling their potential role as environmental educators. Not only was the possibility raised that teachers might be less conservation aware than the pupils surveyed, but that they were generally not perceived by pupils to have had a significant influence upon them in this respect. The research also drew attention to the organisational vacuum in terms of youth involvement in environmental awareness activities. While the filling of this gap is not the sole responsibility of teachers, they can, with their expertise and familiarity with youth, be expected to play a part. The role currently played by teachers in this respect is undetermined, but does not appear to be significant. These results are in accord with the researcher's own observations during several years of teaching and consequently, for the present, the third hypothesis of the study (section 1.4c, p.7) is retained.

This situation is not surprising as teachers in South Africa, who are environmentally or conservationally 'aware', are invariably self-taught in this respect. The vast majority of classroom teachers also have and continue to receive, little if any academic or social support in the matter of environmental education. The issue however, needs to be seen in wider perspective. Three approaches will be useful here i.e. the position of the teacher in comparison with the rest of society and other professions in particular, international comparisons within the teaching profession and role demands expected of the teacher by western society in general.

The first approach has been covered in Chapter 3. However it must be noted that very little has been written about the contribution which environmental education makes to the training of those who enter professions, other than those which might be labelled 'environmental'. In the opinion of Pritchard (1975, p.188):

"This is mainly because there has so far been little attempt to develop this aspect of environmental education. The knowledge public officials, industrialists and other leaders have of their environment has either been obtained in the form of a superficial and little-heeded part of general school education or as a result of having a hobby interest in some country pursuit, or through the public information media of radio, television, newspapers, magazines and books."

Internationally, there is wide recognition of the problem of teacher-quality in environmental education. Attention has been drawn to it by the IUCN (1972b, 1980), Reid (1974), Agne and Nash (1976), Cleary (1976), Council of Europe (1976a), Perrott (1977), Huckle (1980b), Storm (1981) and UNESCO/UNEP (1978, 1981), to name but a few, and the topic has been discussed at several gatherings such as Belgrade and Tbilisi (UNEP, 1977). In South Africa the issue has been raised by Bean (1976), Mdluli (1977) and WLSSA (1980a). Certainly, in the experience of the researcher, the matter of teacher quality has arisen at almost every meeting, symposium or discussion on environmental education attended.

With few exceptions, modern technological societies, including South Africa, demand a lot of their teachers, as any examination of an average teacher's working day will reveal. O'Riordan (1981), in discussing appropriate methodology for various approaches to environmental education, draws attention to the role of the teacher both in terms of personal demands upon them and the energy input required for different levels of operation. In general, he argues, the greater the level of personal involvement and commitment, the more emotionally and intellectually demanding the approach becomes. To this may be added the responsibility of sometimes being the major or the only environmental influence in a child's life. Teachers, being human, are able to cope with these demands with varying degrees of resilience, competence and enthusiasm. The situation is not made easier by the problems faced even by those teachers most dedicated to the cause of environmental education. Apart from demands on time, lack of support from colleagues and logistical difficulties referred to in earlier contexts, problems devolve upon two areas: lack of adequate training and lack of support material, factors integral to sustained teacher quality.

As indicated in Chapter 3, teacher-training in environmental education is,

at the present time, so unusual in South Africa as, for practical purposes, to be almost non-existent. The situation applies equally to initial institution-based training and to professional in-service training, the ACE programme being the only significant exception in the latter regard. There are no part-time courses available in environmental education, despite the wealth of international literature on the topic (Bossanyi, 1977; Hughes-Evans, 1977; Perrott, 1977; Scott, 1981; UNESCO/UNEP, 1981) and the fact that it is now standard fare in many of the developed countries.

As with all environmental education, teacher training, or perhaps more appropriately 'professional preparation', in this area involves not only the transmission of appropriate factual material and cognitive aspects, but attitudinal and behavioural-affective components. Appropriate environmental behaviour on the part of teachers is important because of their constant exposure as models, and therefore the level of criticism to which they are subjected when they do not measure up to expectations. In addition, like many members of the public, they are often simply unaware of how to behave in given environmental situations. One should at all costs prevent situations such as in Natal in recent years, where teachers have reputedly been responsible for starting devastating fires. Not only is the status of the profession lowered by such allegations, but the whole concept of environmental education is open to discredit in the eyes of the public. It is arguable that the integration of environmental issues and problems into relevant individual subjects is as appropriate in the context of teacher education as it is in the school classroom. However a strong case could also be made for a relatively discrete or self-contained course in the methodology of environmental education.

Given the dynamic nature of the subject, another crucial factor in long term effective teaching will be the provision of a wide base of back-up material, supported by in-service assistance on its use and application. The paucity of suitable (i.e. South African based) environmental material for teachers, is the second major inadequacy of the present situation. In the developed world, South Africa is, in the early 1980's, unique in this respect. This refers back to the whole question of relevance discussed earlier. It is suggested that, as in Europe, North America and Australasia, responsibility for the production of appropriate material

lies with both the public and private sectors, each having particular strengths and weaknesses in this regard. The production of informative, attractive material is also a way in which those concerned with environmental education can demonstrate more than simply good intentions.

As the credibility of environmental education as a worthwhile pursuit is likely to be judged on the full ambit of its activities and not only on the performance of regular classroom teachers, the situation of environmental instructors (often called 'field officers') outside of the formal education systems requires consideration. In some countries such as Yugoslavia and the Netherlands, such individuals are required to have some form of certification or recognition before being permitted to practice, but in most western countries this is not the case. In South Africa no survey of the qualifications or quality of this group of individuals, who probably number no more than a few score, has been carried out, but the writer has come across very few trained teachers in these posts, although it is important to emphasise that this is not suggested as the only criterion of judgement. They do however, because of past tardiness on the part of the formal education system, exercise an influence out of all proportion to their number, particularly as regards environmental contact with school children. It is sometimes a matter of concern to the present researcher, based entirely on observation, that the quality of both what is taught and the methods of instruction used by some of these individuals, is questionable.

In step with the evolutionary change in concepts of environmental education over the past 15 years, has been a new knowledge of the process of learning, but there is sometimes little evidence of either facet having filtered through to field officers, or of being applied in the field. In terms of content matter, bushcraft rather than scientifically based ecology, has been and remains the forte of these men and women. Despite the evidence however, that standards and quality are patchy and uneven, some very sound educational work is being done. Furthermore any danger which exists lies rather more in the potential for abuse in the future than in present circumstances. Nevertheless the situation should be subject to ongoing scrutiny, particularly as sounder methods of evaluation are developed.

Looked at in a cost-benefit perspective, any expectations or hopes of raising general levels of environmental awareness in school pupils, without deliberately training and preparing teachers to assist in the process, would not only be highly unfavourable in respect of cost, but unlikely to attract the necessary widespread support. The recognition and application of the 'multiplier effect', whereby the knowledge and expertise of the few are passed on to many, forms the basis of teacher training and is one of the fundamental principles of modern education systems. It cannot continue to be ignored if environmental education is ever to become more than a casual adjunct to other aspects of education. Any broad-based or national effort for increasing environmental awareness would have to be cost-effective to even warrant consideration.

In concluding this discussion on the role of the teacher/educator in environmental education, the following proposals (based on submissions made by the writer for the document A Policy and Strategy for Environmental Conservation in South Africa referred to in Chapter 3) are submitted for consideration by educational and conservation bodies alike:

1. That the role which teachers can play in promoting long-term environmental awareness should be vigorously re-evaluated. At the present time teachers in our society are not generally appreciated either for their worth as guardians of the future or for their potential as agents of change — in this case towards a heightened sense of environmental awareness. Generally speaking neither have they been given the supportive means of doing this. Such a support system could take the form of:
  - a. The incorporation of the environmental awareness concept and its practical implementation into all teacher education courses, including part-time courses. This is a sine qua non for the future of environmental awareness.
  - b. The increased induction of the concept of environmental awareness through in-service courses.
  - c. The provision of suitable back-up material for the use of teachers.
  - d. The provision of local environmental facilities and opportunities where they do not yet exist, and the encouragement

of their correct and optimum use where they do.

- e. The establishment of a 'Journal of Environmental Education' aimed at practising teachers throughout the sub-continent.
2. That where feasible and appropriate, environmental educators outside of the formal education system be chosen from the ranks of qualified and experienced teachers.

In brief all teachers must be given a fair chance to become environmentally and conservationally aware themselves, before being expected to transmit such values to pupils. Quoting from Aldrich and Blackburn (1975, p.172):

"The future will be decided by them — whether this will be by design or default depends upon the quality of education they receive about their environmental responsibilities."

### 9.3 Summary

Throughout this study, a situation has been described, based on primary, secondary and empirical research, in which frequent attention has been drawn to the need for further investigations. It has also become clear that experimentation is required for the development of new, and the modification of existing, methodology and approaches. Concepts require re-consideration and re-definition with a view to achieving a broad base of acceptance. To this end a hierarchy of objectives must be set. Teachers must be allowed to play their rightful role. Most important of all, in a world where there are increasing demands upon scarce financial and other resources, vague and subjective evaluation must be replaced by rigorous testing procedures and objective criteria of analysis. Ultimately environmental and conservation education will only take place if there is a demand based on the knowledge that it is worthwhile.

An appropriate university education faculty might be the best place to co-ordinate the achievement of these ends.

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APPENDIX A

Lists of persons and organisations consulted and places visited during the course of the survey. The lists represent only the most important contributors in terms of the study.

a. Individuals consulted on visits and/or by correspondence

- |               |  |
|---------------|--|
| ALDRIDGE, D.  | Assistant Director (Conservation Education),<br>Countryside Commission for Scotland.<br>Member of Council of Europe, UK representative<br>on IUCN.<br>Perth, Scotland. |
| ANTHONY, A.   | Headmaster, St. Albans School, London.   |
| APPLEBY, M.   | Secretary, Council for Nature, London.   |
| ARNOLD, N.    | Teacher and author, Radipole Primary School,<br>Weymouth, Dorset, England.   |
| BLOSSOM, J.   | Chief Education Officer, The Wildfowl Trust,<br>Slimbridge, England.   |
| BOULTON, M.   | Director, Special Project for the Promotion<br>of Conservation Education, World Wildlife Fund,<br>Cheltenham, Gloucestershire, England.                                |
| BOWEN, U.     | Biology Department, Oxford Polytechnic,<br>Oxford, England.  |
| BRIGHTMAN, F. | Chief Education Officer, British Museum (Natural<br>History), London.  |
| BROOKE, B.    | Warden, Kindrogan Field Centre, Blairgowrie,<br>Scotland.  |
| BULL, T.      | Secretary, Wildlife Youth Services (WWF),<br>Wallington, Surrey, England.  |
| BUTLER, R.    | Secretary, Countryside Commission for Scotland,<br>Perth, Scotland.  |
| CARELLI, D.   | UNESCO Institute for Education, Paris, France.   |
| CARROLL, J.   | Co-ordinator, Environmental Education Programs,<br>USDA, Washington DC.  |
| CARSON, S.    | County Advisor for Environmental Education,<br>Hertfordshire, England.   |

- COOPER, K. Director of Conservation, Wildlife Society of Southern Africa, Durban.
- CROFT, P. Secretary, Field Studies Council, Shrewsbury, England.
- DISNEY, R. Warden, Maltham Tarn Field Centre, Yorkshire, England.
- DUGUET, P. Head of Projects on Innovation in Higher Education, CERI, OECD, Paris, France.
- EMERSON, D. Warden and Director of Studies, Dale Fort Field Centre, Haverford West, Wales.
- FENTON, J. Wildfowl Trust, Slimbridge, England. WWF, IUCN.
- FISHER, R. Conservation Chairman, Federation of Fly-Fishermen Davis, California, USA.
- FLOWER, C. Director, British Trust for Conservation Volunteers, London.
- GAYFORD, C. School of Education, University of Reading, Reading, England.
- HALDEN, P. National Director, Young Ornithologists Club, Royal Society for the Protection of Birds, Sandy, Bedfordshire, England.
- HART, S. Environmental Educationist, White River, Transvaal.
- HODGSON, M. Education Officer, Royal Society for the Protection of Birds, Sandy, Bedfordshire, England.
- HURRY, L. Environmental Educationist, Pretoria.
- JESKE, W. Chief, Education and Publications Branch, Soil Conservation Service, USDA, Washington DC.
- LANE, K. Education Officer, Wildfowl Trust, Slimbridge, England.
- LANGDEN, I. Education Officer, Peak District National Park, England.
- LANGLEY, D. Secretary, Defenders of Wildlife, Washington DC.
- LITTLEWOOD, C. Director, Wildlife Youth Services, Wallington, Surrey, England.
- LOCK, S. Environmental Education Specialist, Division of Interpretation and Visitor Services, USDI, Washington DC.
- LOZANA, R. Chief, UNESCO Section on Environmental Education, Paris, France.

MEYER, J. Inspector of Agriculture, Department of Education and Training, Pretoria.

MORTON, D. Vice President, Environmental Information and Education Division, National Audubon Society, New York.

NETTLETON, J. Director, Brockhole National Park Centre, Windermere, Cumbria, England.

NIEMEYER, R. Michigan State University, East Lansing, Michigan, USA.

NOENNIG, D. Environmental Education Co-ordinator, Bureau of Reclamation, USDI, Washington DC.

NTSIME, J. Secretary for Education, Mmabatho, Bophuthatswana.

OLLASON, R. Education Officer, Royal Zoological Society of Scotland, Edinburgh, Scotland.

ORROM, M. Forestry Management Division, UK Forestry Commission, Edinburgh, Scotland.

PARKER, S. Science Education Centre, University of Zimbabwe, Salisbury, Zimbabwe.

REID, R. Director, North Wales Museum of Wildlife, Betws-y-coed, Wales.

RICHARDS, D. Formerly Education Officer, Umgeni Valley Project, Howick, Natal.

SANDS, T. Director, Society for the Promotion of Nature Conservation, London.

SCHARER, A. The Draper's Field Centre, Rhyd-y-creuau, Wales.

STREETER, J. Education Officer, Gilbert White Field Study Centre, Selbourne, England.

TAYLOR, B. Education Officer, Umgeni Valley Project, Howick, Natal.

V.D. BERG, P. Natal Education Department, Pietermaritzburg, Natal.

WARD, C. Education Officer, TCPA, London.

WEST, R. Department of Education, University of Sussex, Brighton, Sussex, England.

WHEELER, K. Senior Lecturer in Geography, Leicester Polytechnic, Leicester, England.

WILSON, S. National Rifle Association of America, Washington DC.

YAXLEY, P. Education Officer, National Association for Environmental Education, Birmingham, England.

b. Places visited and organisations consulted and/or visited

African Conservation Education Programme. Durban.

American Association of Zoological Parks and Aquariums. Wheeling, W.Va., USA.

Australian Conservation Foundation. Melbourne.

Ball State University, Department of Natural Resources. Muncia, Indiana, USA.

Berkshire, Buckinghamshire and Oxfordshire Naturalists Trust. Oxford, England.

Botanical Society of the British Isles. London.

Boy Scouts Association of South Africa. Durban.

British Museum (Natural History), Education Division. London.

British National Parks and Visitor Centres:

Brecon Beacon National Park	Wales
Dartmoor National Park	England
Lake District National Park	England
Peak District National Park	England

British Trust for Conservation Volunteers. London.

Bureau of Outdoor Recreation, USDI. Washington DC.

Bureau of Sports, Fisheries and Wildlife, USDI. Washington DC.

Centre for Educational Research and Innovation, CERI (OECD). Paris, France.

Council for Environmental Education, University of Reading. Reading, England.

Council for Nature. London.

Council for the Habitat. Pretoria.

Council for the Protection of Rural England. London.

Council of Europe. Strassbourg, France.

Countryside Commission for Scotland. Perth, Scotland.

Cultural attachés of the following countries in Britain:

Bulgaria
Czechoslovakia
Hungary
Poland
USSR
Yugoslavia

Defenders of Wildlife. Washington DC.

Department of Conservation and Extension (CONEX). Salisbury, Zimbabwe.

Department of Nature and Environmental Conservation of the Cape Province.  
Cape Town.

Departments of Education of:

Cape Province	Cape Town
Natal	Pietermaritzburg
Orange Free State	Bloemfontein
Transvaal	Pretoria
KwaZulu	Ulundi
Bophuthatswana	Mmabatho.

Ducks Unlimited. Chicago, USA.

Duke of Edinburgh's Award Programme. London.

Edinburgh Zoological Gardens. Edinburgh, Scotland.

Endangered Wildlife Trust. Johannesburg.

ERIC Science, Mathematics and Environmental Education Clearing House.  
Ohio State University, Columbus, Ohio, USA.

Field Studies Council. Shrewsbury, England.

Dale Fort Field Centre	Haverford West	Wales
Drapers Field Centre	Rhyd-y-creuau	Wales
Epping Forest Field Centre	London	England
Maltham Tarn Field Centre	Settle	England.

Friends of Africa in America. New York.

Gould League of Victoria. Abbotsford, Victoria, Australia.

Graduate Group in Ecology, University of California. Davis, California, USA.

Heritage Education Group, Civic Trust. London.

Hertfordshire County Council. Hertfordshire, England.

Inner London Education Authority. London.

Institute of Environmental Sciences. London.

International Union for the Conservation of Nature and Natural Resources  
(IUCN). Morges, Switzerland.

IUCN NW Europe Regional Council. Perth, Scotland.

Izaak Walton League of America. Arlington, Va., USA.

Keep South Africa Tidy. Johannesburg.

Kindrogan Field Centre. Blairgowrie, Scotland.

Land Service Movement, Department of National Education. Pretoria.

Natal Parks Board. Pietermaritzburg.

National Association for Environmental Education. Birmingham, England.

National Audubon Society. New York.

National Education Association. Washington DC.

National Environmental Awareness Council. Soweto.

National Parks Board. Pretoria.

National Trust. London.

National Wildlife Federation. Washington DC.

Natural Environment Research Council. London.

New Zealand Deerstalkers Association Inc. Wellington, New Zealand.

OECD Publication Division. Paris, France.

Okavango Wildlife Society. Johannesburg.

Orange Free State Division of Nature Conservation. Bloemfontein.

Portasham Environmental Studies Pilot Scheme. Weymouth, Dorset, England.

Royal Society for the Prevention of Accidents. Birmingham, England.

Royal Society for the Prevention of Cruelty to Animals (Education Section).  
Horsham, Sussex, England.

Royal Society for the Protection of Birds. Sandy, Bedfordshire, England.

RSA: Department of Education and Training  
Department of Planning and the Environment  
Department of National Education  
Department of Forestry  
Department of Water Affairs, Forestry and Environmental Conservation  
(since 1980).

Safari Club International Conservation Fund. Tucson, Arizona, USA.

Schools Council. London.

Schools Eco-Action Group. London.

Scottish Environmental Education Committee, Civic Trust. Glasgow, Scotland.

Sierra Club. San Fransisco, California, USA.

Society for the Promotion of Nature Conservation. Lincoln, England.



South African Council for Conservation and Anti-Pollution. Durban.

South African Nature Foundation. Stellenbosch.

South African Ornithological Society. Johannesburg.

The Hague School Garden Service. Den Haag, Netherlands.

Transvaal Division of Nature Conservation. Pretoria.

Umgeni Valley Project. Howick.

UNESCO-UNEP. Paris, France.

UK: Department of the Environment  
Department of Education and Science.

UK Forestry Commission, Information Branch (Schools). Edinburgh, Scotland.

US: Department of Interior  
Department of Interior, National Park Service  
Department of Agriculture, Forest Service  
Department of Agriculture, Soil Conservation Service.  
Department of Health, Education and Welfare, Education Division.

US Government Printing Office, Public Documents Department. Washington DC.

Veld and Vlei Adventure Trust. Estcourt.

Veld Schools of the Transvaal. Transvaal Education Department, Pretoria.

Vereeniging tot Behoud van Natuurmonumenten. Den Haag, Netherlands.

Vereeniging vir die Beskerming van die Omgewing. Stellenbosch.

Volunteers Environmental Resources Centre. Edinburgh, Scotland.

Voortrekker Beweging. Pretoria.

Wilderness Leadership School. Durban.

Wilderness Society. Washington DC.

Wildfowl Trust. Slimbridge, England.

Wildlife Society of Southern Africa. Durban/Johannesburg.

Wildlife Society of Zimbabwe. Salisbury, Zimbabwe.

Wildlife Youth Services of WWF. Wallington, Surrey, England.

World Scout Bureau. Geneva, Switzerland.

World Wildlife Fund. Geneva, Switzerland.

World Wildlife Fund, Education Section. Cheltenham, England.

APPENDIX B

- a. A copy of the original questionnaire given to pupils.
- b. Administration schedule.

INTEREST QUESTIONNAIRE

Wherever there is a box place a (✓) in the appropriate place unless otherwise instructed.

A1 

MALE	FEMALE
AGE: <input style="width: 100px; height: 15px;" type="text"/>	

A2 

FATHER'S OCCUPATION <input style="width: 150px; height: 15px;" type="text"/>
MOTHER'S OCCUPATION <input style="width: 150px; height: 15px;" type="text"/>

A3 Which of the following subjects are you studying at present?

Geography	
Biology	
Agriculture	

A4 What is your home town at present?

A5 Where else have you lived in the past ten years?

A6 Do you belong to any of the following organisations?

Boy Scouts/Girl Guides		
Voortrekkers		
A wildlife society		
A bird club		

A7 Have you ever been on a:

Land Service Camp			
Veld and Vlei course			
Wilderness Leadership School course			
Parks Board Wilderness Trail			
Joint Venture course at Umgeni Valley			
Cedara School Camps			

A8 Have you ever been to:

Kruger National Park  
 Giant's Castle Game Reserve  
 Royal Natal National Park  
 Umfolozi or Hluhluwe Game Reserves  
 Mkuzi or Ndumu Game Reserves  
 Stainbank Nature Reserve  
 Queen Elizabeth Park  
 Natal Lion Park  
 A Botanical Garden


Name any other Game Reserves, Nature Reserves or wild places you have visited.

A9 Do you go to these sort of places;

once every few years  
 once a year  
 three times a year  
 once a month  
 more often than once a month


A10 Do you usually go with;

your parents  
 friends or relatives  
 the school or a teacher  
 a youth or church group


A11 Have you ever had a teacher who strongly encouraged you to take an interest in wildlife?

YES	NO
-----	----

A12 Do you regularly read:

African Wildlife  
 Custos  
 Toktokkie  
 Flora and Fauna  
 Ostrich  
 Bokmakierie  
 Krantz


A13 What are your major hobbies?

A14 Do you have books on wildlife at home?

YES	NO
-----	----

A15 Have you ever heard of the:

Wildlife Society of Southern Africa  
 S.A. Nature Foundation  
 Natal Parks Board  
 National Parks Board

YES	NO
YES	NO
YES	NO
YES	NO

What do the letters IUCN stand for? \_\_\_\_\_

What do the letters WWF stand for? \_\_\_\_\_

B1 What do you understand by the term "wildlife conservation"?

B2 Baboons \_\_\_\_\_  
Antelope \_\_\_\_\_

B3 

YES	NO	NOT SURE
-----	----	----------

B4 

YES	NO	NOT SURE
-----	----	----------

B5 

YES	NO	NOT SURE
-----	----	----------

YES	NO	NOT SURE
-----	----	----------

B6 

YES	NO	NOT SURE
-----	----	----------

B7 [ YES ] [ NO ] [ NOT SURE ]

B8 [ YES ] [ NO ] [ NOT SURE ]

B9 [ YES ] [ NO ] [ NOT SURE ]

B10 [ YES ] [ NO ] [ NOT SURE ]

B11 [ YES ] [ NO ] [ NOT SURE ]

B12 [ YES ] [ NO ] [ NOT SURE ]

C1 

YES	NO	NOT SURE
-----	----	----------

C2 

YES	NO	NOT SURE
-----	----	----------

C3 

YES	NO	NOT SURE
-----	----	----------

C4 

YES	NO	NOT SURE
-----	----	----------

C5 

YES	NO	NOT SURE
-----	----	----------

C6

C7 Severely punished  
Mildly punished  
Not punished at all




C8 

YES	NO	NOT SURE
-----	----	----------

C9 

YES	NO	NOT SURE
-----	----	----------

C10 

YES	NO	NOT SURE
-----	----	----------

C11 

YES	NO	NOT SURE
-----	----	----------

C12 

YES	NO	NOT SURE
-----	----	----------

C13 

YES	NO	
YES	NO	NOT SURE

C14 

YES	NO	NOT SURE
-----	----	----------

C15 

YES	NO
-----	----

C16

C17 List what you would consider to be South Africa's 5 most important natural resources.

C18 Write down what you would consider good reasons why a portion of our country should be retained for game reserves, nature reserves and wild areas.

C19 When you go into a "wild" place where there are some wild animals (not necessarily dangerous) do you:

- immediately feel part of it
- take a little while to feel part of it
- remain a little insecure throughout your stay


Do your feelings change after a few days?  
How?

YES	NO
-----	----

C20 If you owned a beautiful piece of country on which you wished to build your dream house and you were told that you had to sell it as the area was best suited to nature conservation, would you:

- be very angry and refuse to sell
- be annoyed but sell anyway
- be quite happy to sell


C21 Assuming that you are a taxpayer paying R100 p.a., how would you divide it among the following causes?

Provision of housing for the lower income groups & poor

Reduction of personal income tax

Wildlife Conservation

Building of new highspeed freeways

Building of a new sports stadium

Subsidizing food to make it cheaper

Removing taxes on luxury goods


C22 What do you think needs most to be done for the best future of nature conservation in South Africa?

C23 How do you think you are ever likely to benefit from nature or wildlife conservation?

D1 What do you see as the most important environmental problems facing:  
South Africa:

The World:

D2 Do you think our environment and South African way of life are threatened by any of the following phenomena?

Soil erosion		
Depletion of our mineral resources		
Inadequate protection of our wild birds & animals		
Inadequate protection of some of our wild and beautiful places e.g. forests & estuaries		
Inadequate water supplies		
Chemical pollution of our rivers		
Atmospheric pollution		
Poor farming methods		

D3 If large numbers of people are allowed into game and nature reserves as might happen in the future, which of the following phenomena do you think might occur?

Too much disturbance of wildlife & therefore decreased breeding	
A severe litter problem	
Too much development e.g. restaurants, swimming pools etc	
Increased damage of vegetation	
Increased danger of fires being started	
Far more money coming to nature conservation	
A greater appreciation of nature by the public and therefore greater respect	

D4 Do you think that mankind will perish in your lifetime?  YES  NO

If you answered "Yes", rank the following from 1 to 6 in order of likelihood:

Outbreak of nuclear war  
 Air and water pollution  
 Food shortage  
 Drain of natural resources  
 Spread of an incurable disease  
 General degradation of the environment


D5 In order of importance for man's future well being and happiness, complete the table below in the following terms:

- 1 very important  
 2 of some importance  
 3 of no importance  
 0 no opinion

Control of population growth  
 Pollution control  
 More careful use of resources & recycling  
 The conservation of wildlife & natural areas  
 The improvement of farming technique & management

WORLD	S.A.

D6 What do you think the future of wild animals, wild birds and wild places is in:

Excellent  
 Good  
 A 50-50 chance  
 No real hope  
 No future

WORLD	S.A.



A8 Was jy al ooit na:

Kruger Nasionale Wildtuin	
Giant's Castle Wildreservaat	
Koninklike Natalse Nasionale Park	
Umfolozi of Hluhluwe Wildreservate	
Mkuzi of Ndumu Wildreservate	
Stainbank Natuurreservaat	
Queen Elizabeth Park	
Natalse Leeupark	
'n Botaniese Tuin	

Noem enige ander wildreservate, natuurreservate of plekke met  
ongesonde natuurskoon wat jy al besoek het.

A9 Besoek jy hierdie soort plekke;

eenmaal elke paar jaar	
eenmaal per jaar	
driemaal per jaar	
eenmaal per maand	
meer as eenmaal per maand	

A10 Gaan jy gewoonlik saam met;

jou ouers	
vriende of familie	
die skool of 'n onderwyser	
'n jeug- of kerkgroep	

All Het jy al ooit 'n onderwyser/es gehad wat jou sterk aangemoedig  
het om in natuurbewaring belang te stel?

JA	NEE
----	-----

A12 Lees jy gereeld:

African Wildlife  
 Custos  
 Toktokkie  
 Flora and Fauna  
 Ostrich  
 Bokmakierie  
 Krantz


A13 Wat is jou belangrikste stokperdjies?

A14 Het jy boeke oor natuurbewaring tuis?

JA	NEE
----	-----

A15 Het jy al ooit van die volgende organisasies gehoor?

Natuurlewevereniging van Suiderlike Afrika  
 S.A. Natuurstigting  
 Natalse Parkeraad  
 Nasionale Parkeraad

JA	NEE
JA	NEE
JA	NEE
JA	NEE

Waarvoor staan die afkorting "IUCN"?

Waarvoor staan die afkorting "WWF"?



B1 Wat verstaan jy onder die benaming "Natuurbeewaring"?

B2 Bobbejane \_\_\_\_\_  
 Wildsbokke \_\_\_\_\_

B3 

JA	NEE	ONSEKER
----	-----	---------

B4 

JA	NEE	ONSEKER
----	-----	---------

B5 

JA	NEE	ONSEKER
----	-----	---------

JA	NEE	ONSEKER
----	-----	---------

B6 

JA	NEE	ONSEKER
----	-----	---------

B7 JA NEE ONSEKER

B8 JA NEE ONSEKER

B9 JA NEE ONSEKER

B10 JA NEE ONSEKER

B11 JA NEE ONSEKER

E12 JA NEE ONSEKER

C1 

JA	NEE	ONSEKER
----	-----	---------

C2 

JA	NEE	ONSEKER
----	-----	---------

C3 

JA	NEE	ONSEKER
----	-----	---------

C4 

JA	NEE	ONSEKER
----	-----	---------

C5 

JA	NEE	ONSEKER
----	-----	---------

C6

C7 Swaar gestraf word  
Lig gestraf word  
Gladnie gestraf word nie


C8 

JA	NEE	ONSEKER
----	-----	---------

C9 

JA	NEE	ONSEKER
----	-----	---------

C10 

JA	NEE	ONSEKER
----	-----	---------

C11 

JA	NEE	ONSEKER
----	-----	---------

C12 

JA	NEE	ONSEKER
----	-----	---------

C13 

JA	NEE	
JA	NEE	ONSEKER

C14 

JA	NEE	ONSEKER
----	-----	---------

C15 

JA	NEE
----	-----

C16

C17 Wat is volgens jou mening Suid-Afrika se 5 belangrikste natuurlike hulpbronne?

C18 Skryf neer wat jy beskou as goeie redes waarom 'n deel van ons land vir wildreservate, natuurreservate en ongeskonde natuurskoon behoue moet bly.

C19 As jy 'n plek met natuurskoon binnegaan waar daar wilde diere is (nie noodwendig gevaarlikes nie) voel jy:

onmiddellik deel daarvan  
dat dit jou 'n tydjie neem om deel daarvan te voel  
'n bietjie onveilig tydens jou hele verblyf


Verander jou gevoel na 'n paar dae?  
Hoe?

JA	NEE
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C20 As jy 'n baie mooi plek besit het waarop jy graag jou droomhuis sou wou bou, en jy word aangesê om dit te verkoop aangesien die gebied meer geskik is vir natuurbewaring, sou jy:

baie kwaad wees en weier om te verkoop  
kwaad wees maar nietemin tog verkoop  
gelukkig wees om te verkoop


C21 Gestel jy is 'n belastingbetaler wat jaarliks R100 betaal.

Hoe sou jy dit onder die volgende instansies verdeel?

Voorsiening van behuising vir die laer inkomstegroepe

en armes

Vermindering van persoonlike belasting

Natuurbewaring

Die bou van nuwe snelweë

Die bou van 'n nuwe sportstadion

Die subsidiëring van kos om dit goedkoper te maak

Die belasting op luukse artikels af te skaf


C22 Wat dink jy behoort in Suid-Afrika veral gedoen te word om die beste toekoms vir natuurbewaring te verseker?

C23 Hoe dink jy sal jy ooit by natuur- of wildbeskerming baat?

D1 Wat beskou jy as die belangrikste omgewingsprobleme waarmee:  
Suid-Afrika te kampe het:

Die wêreld te kampe het:

D2 Dink jy dat ons omgewing en die Suid-Afrikaanse lewenswyse ernstig  
deur enige van die volgende verskynsels bedreig word:

Gronderosie		
Die uitputting van ons minerale bronne		
Onvoldoende bewaring van ons wilde voëls en diere		
Onvoldoende bewaring van party van ons natuurskoon plekke b.v. bosse en riviermondings		
Ontoereikende waterbronne		
Chemiese besoedeling van ons riviere		
Lugbesoedeling		
Swak boerderymetodes		

D3 As groot getalle mense in natuur- en wildreservate toegelaat  
word soos dit in die toekoms mag gebeur, watter van die volgende  
dink jy sal gebeur?

Te veel steuring ten opsigte van die wildlewe met gevolglike vermindering van aanwas	
'n Geweldige vullisprobleem	
Te veel ontwikkeling b.v. restaurante, swembaddens ens.	
Vermeerderde beskadiging van plantegroei	
Verhoogde gevaar van vure wat gestig kan word	
Baie meer geld wat aan natuurbewaring toegestaan word	
'n Groter waardering van die natuur deur die publiek en dus 'n groter respek daarvoor	