

Wilderness Information Systems for Education: A Proposed Management Framework.

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Preface

The research described in this mini-dissertation was carried out at the Centre for Environment and Development, University of KwaZulu-Natal, Pietermaritzburg under the supervision of Dr Nevil Quinn and co-supervision of Sonja Krueger, Regional Ecologist of Ukhahlamba for EKZN Wildlife.

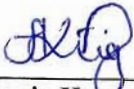
The mini-dissertation represents the original work of the author and has not been otherwise submitted in any form for any other degree or diploma at any university. Where use has been made of the work of others it is duly acknowledged in the text.



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Dr. Nevil Quinn



Sonja Krueger

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Abstract

South Africa's well-established history of formally protected areas has resulted in it becoming a global leader in resource conservation and a pioneer of new management techniques. Roughly thirty years ago, South Africa became one of the earliest countries in the world to legislatively recognise wilderness. Since the first wilderness areas were designated, use and management issues have become increasingly complex as managers strive to balance the biological and social values of wilderness areas. Consequently, it is imperative that management techniques and strategies evolve to preserve wilderness values and resources in South Africa.

Wilderness visitor education and information programs are a critical part of an effective wilderness management strategy. To ensure that wilderness education and information systems are inclusive and able to evolve over time three elements are needed. A management framework must be in place to ensure that a system-wide approach is established and maintained. Once a system-wide framework is established, wilderness education and information systems can be inventoried and monitored against established management goals. This information can then be used to continually refine and improve wilderness information and education systems as they evolve through increased understanding of use and management issues. Lastly, increased wilderness-specific research and continued testing of current research in the South African context is needed, to ensure that management strategies stay relevant and adaptive. These adaptive management strategies will serve as the foundation for wider coordination of wilderness management and research at the provincial and national levels, further developing South Africa's leadership role in protected area management in Africa and the global community.

Component A

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List of Abbreviations

MDTCDA- Maloti-Drakensberg Transfrontier Conservation and Development Area

UDP- uKhahlamba-Drakensberg Park

UDWMP- uKhahlamba-Drakensberg Wilderness Management Plan

WES- Wilderness Education System

WISE- Wilderness Information Systems for Education

Chapter 1

Introduction

The system of protected areas in South Africa has a long and rich tradition going back more than a hundred years (Bainbridge, 2001:a). Wilderness plays a unique and vital role within this system to conserve a wide range of social and biological values. The biological values of wilderness in South Africa include protection for many endemic and/or threatened plants and animals, genetic reserves for wildlife populations and corridors between densely populated or developed areas. The social values include protection of clean water resources, centres for environmental education, opportunities for unique forms of unrestricted recreation and may also include the biological resources as used by people. However, as the demands on these resources increase there is a need to increase the level and sophistication of management of wilderness areas in South Africa. Visitor management in particular is of growing importance at a global as well as national scale.

Issues relating to impacts from visitors to wilderness areas are wide-ranging and complex. They can range from simple issues such as too much litter on a trail to highly complex issues of crowding and loss of a sense of place. There are many techniques that wilderness managers can use to address visitor use issues. Which technique is chosen is often decided within the context of meeting the multiple demands and constraints of wilderness management. Access to wilderness areas must be secured while ensuring that impacts from this use do not diminish the natural resource or associated wilderness values of solitude, primitiveness and unrestricted recreation. Management techniques must also be considered under the common constraints of limited budgets, staff and other resources. For these and other reasons, managers and visitors often see information and education programs as a preferred management technique. This paper will discuss and illustrate the various elements needed to develop, plan, implement and evaluate wilderness information and education programs used for visitor management within a South African context.

1.1 Wilderness Background

On an international level, wilderness was first legally recognized in the United States with the passing of The Wilderness Act of 1964. It took eight years of development and compromise between various stakeholders before the act was passed. In this legislation the first formally recognized definition of wilderness was provided. The legal definition is complex and its interpretation is still the subject of many academic and managerial debates today (Callicott & Nelson, 1998). The full definition is found in Appendix A. Concurrently and soon after, wilderness as a management concept was being used and developed in other countries around the world such as Australia (Buckley, 2000) and South Africa (Bainbridge, 2001:a). In 1971 the Parliament of South Africa made an amendment to the Forest Act (no. 72 of 1968) allowing for the first time, the legal designation of wilderness in its country. However, this piece of legislation did not provide a South African definition of wilderness. The current situation of the South African definition for wilderness is discussed further in section 2.5.2.

While the specific definition of wilderness varies from country to country there are some similarities that indicate the unique value that wilderness areas represent within a larger protected-area system. A broad definition of the physical characteristics that encapsulate the similarities is provided by the IUCN. They define six protected area categories (Davey, 1998). In category I (b) wilderness is defined as a “large area of unmodified or slightly modified land and/or sea, retaining its natural character and influence, without permanent or significant habitation, which is protected and managed so as to preserve its natural condition.” In the absence of a South Africa specific definition, the IUCN definition is used for the purposes of management. However, this definition does not reflect the full value of wilderness within the international or South African communities. As MacDevette (1990) explains “wilderness means different things to different people. It is not just a particular collection of objects within an easily defined setting, it is a collection of feelings about those objects.” This illustrates how important it is that South Africa is able to establish a context-specific legal wilderness definition. This is discussed further in section 2.5.2. Other values associated with wilderness within the international community are such things as opportunities for solitude, outdoor recreation, risk,

challenge, therapeutic activity, and education (MacDevette, 1990; Cole & McCool, 2000; Bainbridge, 2001:a).

1.2 Wilderness Pressures

Recent decades have shown an increase in the pressures on wilderness areas. This has created some formidable challenges for managers to protect the wilderness qualities of these areas while addressing the driving forces behind the pressures. The pressures can be divided into two major categories. The first category is an increase in the demand for natural resources. That is to say that growing global populations and distribution of those populations will increase the need for natural resources found in wilderness because the resources will become increasingly depleted outside wilderness areas. Examples of these resources include wood, water and wildlife. The second category is increased visitation to wilderness areas with the result being a greater need to manage potential negative visitor impacts to the physical and social values of wilderness areas.

1.2.1 Increased Demand for Resources

Increasing global populations are and will continue to put more pressure on resources located in wilderness areas. The United Nations reported in 1996 that as of the year 1994 the global population was 6 billion. By the year 2050 the global population is projected to be 10 billion (United Nations, 1996 as cited in Stankey, 2000). This clearly indicates a sharp rise in the demand for raw natural resources over the next few decades. Another factor that compounds this situation is the widening trend of the global wealth distribution gap. In the same report by the United Nations it was indicated that in 1992 20% of the global population lived in the developed countries of the world. By 2050 it is projected that only 12% of the global population will reside in those same developed countries (United Nations, 1996 as cited in Stankey, 2000). What this means is that more of the world's increased population will be living within developing countries and increasing the demand on their natural resources (Stankey, 2000) By the year 2050 just under 90% of the global population will live in developing countries that are characteristically depended on natural resources. The implications of this in the African context can be seen in the following example. In the "Africa in Transition" study

undertaken by the World Bank in 1995 it was indicated that 70% of the poor live in rural areas and depend on agriculture, agro-industry and marketing for their livelihoods. At the same time agricultural production grew at 1.3% in the 1980s while population grew at a rate of 2.3% (MacDevette, 1995). It is important to keep in mind that wilderness areas are generally located adjacent to rural areas such as those described in this example. The same report also found that forests are receding at a rate of 4 million ha per annum. It was indicated that 80% of this deforestation is attributed to farmer/herder encroachment as well as firewood gathering from adjacent communities (MacDevette, 1995). Clearly, the challenge for protected area managers will be to understand and manage the role of the wilderness area within the larger context of the social and protected area systems. Equally important and necessary will be the need to manage wilderness visitors and the general public's awareness of the values associated with wilderness as opposed to other land allocations or uses.

1.2.2 Increased visitation to wilderness areas

The second category of pressure on wilderness areas is the increase in visitor numbers. This is an issue of international importance. The existing body of literature suggests that in various places around the world the demand for wilderness areas and wilderness type experience exceeds the supply available (MacDevette, 1990; Cessford & Dingwall, 1997; Cole & McCool, 2000). This issue has also been raised in South Africa, specifically in the province of KwaZulu-Natal, as a result of increased marketing of World Heritage sites that include the case study wilderness area and other prestigious designations (UDPWMP, 2003). If not managed properly impacts from increased visitation could lead to the deterioration of the very values and conditions that have led to wilderness designation in the first place. At the same time, conservation programs in many areas are facing threats from a decrease in funding (Starzell, 1995; Buckley, 2000; Davis, 2002). This has led wilderness managers to focus on the need to incorporate management techniques that are cost-effective and focused on long-term solutions.

1.3 Rationale

Visitor management is an essential element of an effective protected area management strategy. The literature suggests that information/education programs, monitoring/reporting systems and relevant “people” based research are areas of increasing importance in management plans in South Africa as well as at an international level. Likewise, it is recognized that such management plans should be developed based on sound scientific information in combination with an understanding of the social context. A solid foundation of visitor management-related research is found in such countries as Australia, the United States and various European countries. However, this research may not be relevant within an African context and gives rise to the need for South Africa to develop its own body of related research. Currently, South Africa has begun this process but is still in the infancy stage of developing its own body of wilderness specific information. Managers within the provincial conservation agency for KwaZulu-Natal, EKZN Wildlife, are currently in the process of developing a wilderness management plan (UDPWMP, 2003) for areas within the Ukhahlamba-Drakensberg Park (UDP). In the current draft version it has been stated that baseline research in the area of “visitor awareness” would be valuable and enhance various components of the wilderness management strategy. In addition, baseline information would serve as a foundation for future research needed to evaluate and improve management strategies over time, specifically management plans for wilderness areas located within the UDP. This formative evaluative research is undertaken in an effort to contribute to this baseline research for South Africa. More specifically, this study intends to focus on the development of a proposed management framework for information and education systems for the purposes of visitor management in the UDP. This focus will be guided by three research questions as follows:

1. What is legally mandated in current provincial, national and international policy and legislation in regards to the development of wilderness management strategies in the province of KwaZulu-Natal?
2. What are appropriate criteria for a proposed information and education management framework for the purposes of visitor management within a South African context?

3. How can wilderness managers use these criteria for the purposes of visitor management in South Africa?

1.4 Site Description

The Mlambojja Wilderness Area is located in the north-western region of the province of KwaZulu-Natal in the Drakensberg mountain range within the Cathedral Peak area. In addition, it shares its western boundary with the Kingdom of Lesotho. A more detailed illustration of its location is in Appendix B. It was designated in the Government Notice 961 of 1989 and is 6,270 hectares in size. The Mlambojja Wilderness Area is one of four formally recognized wilderness areas located within the UDP, which was designated as a World Heritage Site in 2000 based on both the natural and cultural qualifications. At the time, only 23 World Heritage Sites in the World had been listed based on both natural and cultural criteria. Examples of the natural and cultural values can be seen in the fact that between the four wilderness areas in the UDP just fewer than 300 bird species are protected. Of these 300 species, 31 are endemic and 41 are threatened (Bainbridge, 2001;a). In addition, there is no “other area in Africa that contains such a density and diversity of San rock arts sites and images” (Derwent, Porter & Sandwith, 2001 p12). The Mlambojja Wilderness Area is also an important part of the newly established Maloti-Drakensberg Transfrontier Conservation and Development Area (MDTCDA). This area is noted as having especially significant biological values as well. The MDTCDA has been identified as a unique floral region due to the fact that 51.5% of the plants are endemic. The region has also been listed as one of the world’s 200 most important eco-regions as identified by WWF International (Derwent *et al.*, 2001). These elements help to illustrate the high natural and cultural value the Mlambojja Wilderness Area. As a result, it is considered a popular destination within the UDP receiving 6,000+ visitors a year (Kruger, *pers com*) and this number is expected to increase for reasons previously discussed. Clearly, the Mlambojja Wilderness Area has high natural and cultural value for South Africa and the world. Thus, the need to protect these values while providing access is of the highest priority.

1.5 Research Aims and Objectives

The aims of this study are two-fold. The first aim of this study is to develop, test and refine a proposed management framework for wilderness information and education programmes in the UDP. This is done with the intention that the proposed management framework can be used to improve the process of inventorying, monitoring and improving wilderness information and education programmes used for visitor management. Secondly, this study aims to make recommendations for future research in order to strengthen the body of South Africa specific information for the planning, development and implementation of a proposed information and education management framework in South Africa. These aims are operationalized as research objectives, which are detailed below.

1. To develop a proposed information and education management framework specific to South Africa.
2. To field-test the proposed information and education management framework.
3. To refine the proposed information and education management framework.
4. To make research recommendations to further the understanding and effectiveness of a proposed information and education management framework in South Africa.

1.6 Methodology Process Overview

This section serves as a general overview of the methodology to be used in this study. This is done with the intention of making it clear early on how the various elements of this paper fit together and their intended purpose. A much more detailed discussion is given to each of the various steps in the methodology discussion in chapter 5.

Currently, no comprehensive wilderness information and education system exists in South Africa. Consequently, this study intends to develop and propose a new wilderness information and education management framework that functions on a system-wide level that is specific to South Africa. The proposed management framework will be developed primarily based on a comprehensive literature review, but will also be based on information gained from key informants and personal experience. Once the proposed management framework has been developed it will be field-tested. Thus allowing for

additions, adjustments and improvements to be made to the various elements. Finally, the tested and refined proposed management framework will be put into a format that will allow it to be utilized immediately by wilderness managers and function as a wilderness education tool itself. In addition, recommendations will be made for further research needed to improve wilderness information and education programmes in South Africa.

1.7 Limitations and Assumptions

As in any study undertaken there are certain limitations and assumptions that constrain it. However, if those limitations and assumptions are not made explicit expectations for what the study can or intends to accomplish may be misguided. As a result, the limitations for this study are made explicit below. This will help to make clear the context and boundaries for this study.

- This study was undertaken with very tight constraints. The main constraints were a time limit of six months, limited transportation and no outside funding. These constraints have important impacts on the study including; scope of possible case study sites, limits on use of methodologies that require expensive technology, extensive travel and number of case study sites included. These constraints should be considered when evaluating related issues within the study.
- The impacts and role of wilderness education are far-reaching beyond the four stages of the proposed information and education management framework. Examples of other aspects include NGOs, classroom programs and media. However, these elements are beyond the scope of this study. As a very early step in the process of development and testing of the proposed management framework the study chose a narrow focus and quality over wide-breadth and little depth. As a result, this study focuses only on those elements of information and education program that are under the control of managing agencies for on-site visitors.

This implies that sources of wilderness information such as private/commercial websites, guidebooks and school/community programmes are not included in this preliminary

study. It is however foreseeable that these elements of wilderness education could become included as part of alternative information and education systems (Commercial system, Private system, *etc*) that develop after initial research and testing has established a strong foundation.

As with the limitations, it is essential that the underlying assumptions of this study be made explicit in order to aid in the development of appropriate expectations and increase the level of transparency for the study. This study is founded on two primary assumptions detailed as follows:

- A multi-disciplinary, triangulation of theory approach in the literature review complemented by consultation with key informants and personal experience will provide a significant foundation for the development a proposed information and education management framework in South Africa.
- As an early study in the field of South Africa-specific wilderness research the intent of the project is primarily exploratory. Consequently, this study assumes its role is to begin the process of raising questions and identifying needs, rather than provide answers to larger more in-depth research questions.

Chapter 2

Establishing a Conceptual Framework for Wilderness Management

There are two distinct elements of the conceptual framework for this study. The first is the collection of theories that influence this study and the particular paradigms and approaches that are intended. These theories include areas such as managing human behaviour, management specific to wilderness areas and the use of the specific management techniques of environmental education and interpretation. The second element is a framework illustrating the processes that influence the interaction of the three theoretical areas of wilderness management, human behaviour and information and education.

2.1 Theoretical Framework

There are three theoretical areas that inform the intended focus of this study. The first is wilderness management theory, specifically the area of recreational visitor management. This theoretical area is used in an effort to inform the study of relevant needs and tested methods for managing visitor impacts to resources in wilderness areas. This will also include the relevant policy and legislation for wilderness managers in South Africa. The second theoretical area of relevance is environmental education and interpretation. This body of theory will inform the study as to what educational techniques have been effective, challenges in environmental education and identified research needs. The third theoretical area is behaviour modification. This theoretical area will specifically inform the type and form of educational techniques to be used in the proposed information and education management framework if attitudes and behaviours are to be specifically targeted. Thus, the foundation of this study is the synthesis of the information and ideas each area provides. This synthesis will then guide the methodology, assumptions and formative elements of this study. These overlapping influences are illustrated below in Figure 2.1.

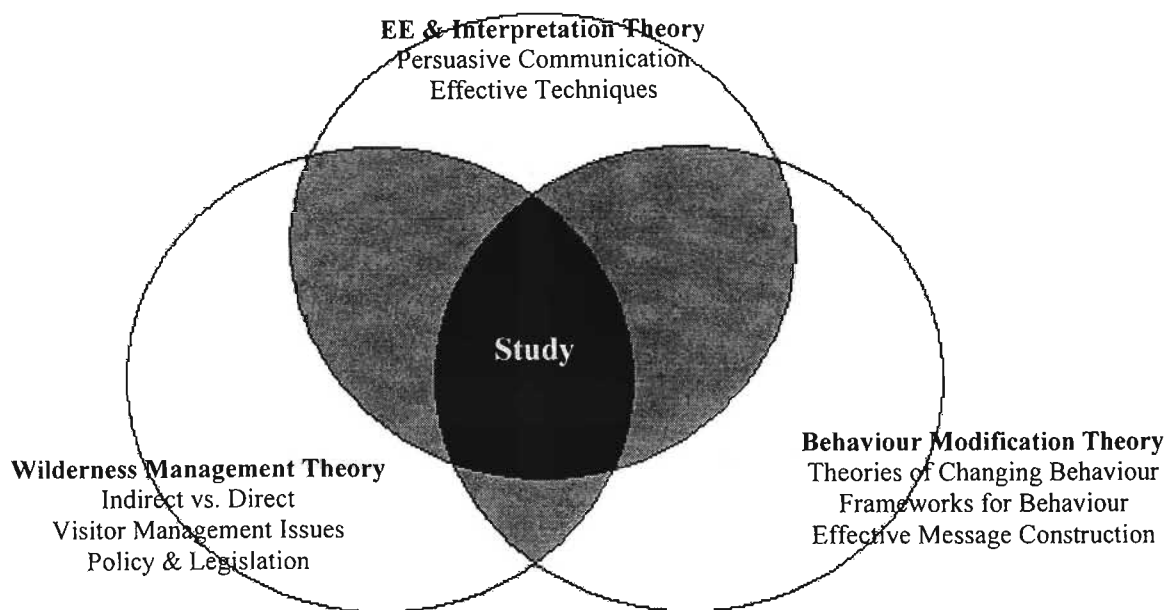


Figure 2.1: Three main theoretical areas that contribute to this study

2.2 Wilderness Resources and Values Framework

Visitor management for wilderness areas fundamentally consists of finding the equilibrium between two management objectives. Managers must find the balance between providing access and managing the impacts on the wilderness resources and experience that come from that visitation (Cole & McCool, 2000). This must be accomplished within a myriad of constraints including; limited budgets, policy, rising visitor numbers and increased demand for alternative land uses. If wilderness managers are to be successful in finding the balance on a short and long-term basis a double-barrelled approach is needed. Reactive/direct management practices such as trail closures; fines for violations and restoration projects are needed in order to address current issues and immediate problems. However, preventative/indirect approaches are also needed in order to prevent the negative impacts from occurring in the future. In order to effectively understand visitor use trends and associated impacts it is essential to understand the larger elements and processes that contribute to them. These elements include knowledge and attitudes, policy and management, level of wilderness legal protection, human and ecological values and meanings, personal and social benefits.

Figure 2.2 illustrates the relationship between these elements and how they influence and are influenced by visitor use trends and associated impacts.

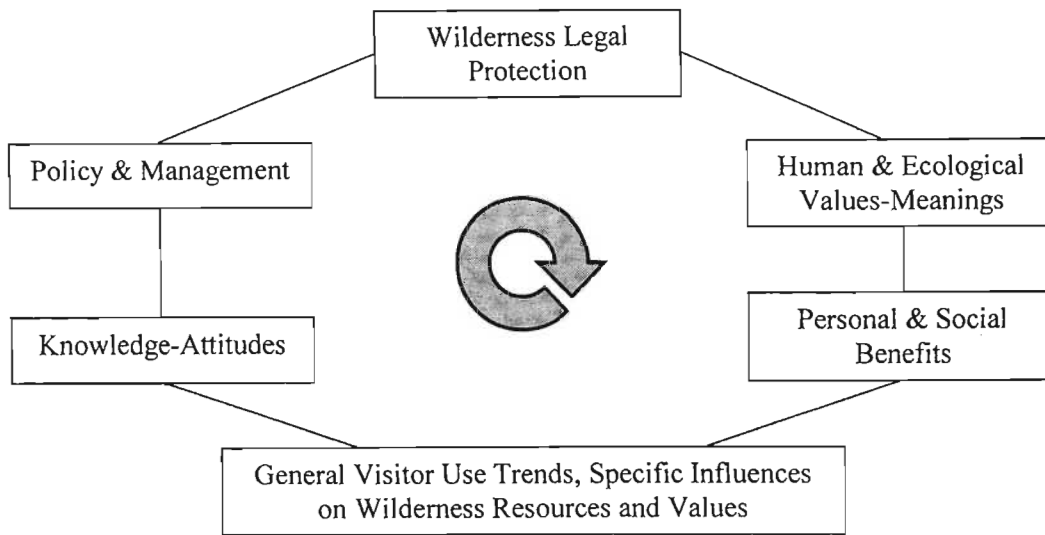


Figure 2.2 Influences on wilderness resources and values (Watson, 2000)

Within this framework it becomes clear that a proposed information and education management framework is a potentially powerful management tool when based on a comprehensive literature review. The literature review will allow specific information to be established for each of the elements of the framework in Figure 2.2., thus turning the general framework into a working tool for understanding the influences on wilderness resources and values in South Africa. For example, the literature informs the study of current personal and social benefits from wilderness in South Africa and how they are established. As all the elements of the framework are filled in with the literature review information, it will become clear how wilderness managers can manage or influence the other elements in the framework. Opportunities for contact with education materials at various points in the recreation experience could have significant implications for visitor behaviour in wilderness areas. As a result, the proposed information and education management framework has a potentially important role for establishing and maintaining the dynamic balance between the demands for increased visitation and mitigating the resulting impacts on the wilderness resources and values.

2.3 Examples of New Directions in Wilderness Management Approaches

The categories of wilderness pressures have played a significant part in the development of a body of theory specifically focusing on the management of the impacts, experiences and perceptions of visitors. It is important to note that the majority of visitor management research has been conducted in more developed countries such as the United States and Australia. However, there has been an increase in the amount of research, information and training being done and shared in other less developed countries, including South Africa. There are two reasons why an understanding of the evolving and emerging international information and research endeavours is important for South Africa. The first reason is that these examples illustrate the growing need for wilderness related research and information, especially in developing countries. Secondly, they show that there is a growing global network of literature and research that South Africa should be participating in, especially if it is going to continue as a leader in African conservation and beyond. The following is a brief description of some of the projects and programs being done in various countries around the world and the implication for South African wilderness management.

The first example comes from South Africa. Prior to the 7th World Wilderness Congress held in South Africa a wilderness management workshop was held. As Draper and Watson (2002) explain, this workshop had participants from a wide range of participants from around Africa and the world including; Uganda, Ghana, Zimbabwe, South Africa, Botswana, Swaziland, Angola, Brazil, Russia, Canada and India. The workshop focused on a variety of topics ranging from management plans to wilderness philosophy and provided important insights. The main significance of this workshop to this study is that it was able to identify that there are certain issues that are unique to Africa and South Africa. This strongly supports the need for wilderness related research to be developed that is specific and adapted to a South African context.

The second example comes from South America. In 1993 a community ranger program was initiated in the Cayambe-Coca Ecological Reserve in Ecuador. Ulfelder (1998) discusses the background, effectiveness and implications of the program that uses local

residents as rangers for the reserve. This example has two important implications for South Africa. The first implication is that creative approaches are being used in other developing countries to address the issues of limited funding, the need to involve and empower local communities and limited infrastructure. These approaches could be adapted to address some of the same issues for wilderness managers in South Africa. The second implication of this example is that to establish programs, evaluate and improve them a foundation of South Africa-specific research is needed.

The final example comes from Russia. Ostergren and Hollenhorst (2000) discuss the use of a system for recording significant information and research done for a specific protected area. In particular, the “zapovedniki” or strict nature reserve, which is seen as *de facto* wilderness areas. Ostergren and Hollenhorst (2000) discuss how this approach is a source of important information for protected-area managers and researchers from a range of disciplines because of its systematic approach and the longevity of the information. In several cases the system has been in place since the 1920s and 1930s. In their article they suggest that the system could be adapted to the United States. It would not be unrealistic to extend this suggestion to other countries that are concerned with the long-term protection of their wilderness areas, such as South Africa. Another implication from this example for South Africa is that a systematic approach is needed if wilderness management is going to be successful on a long-term basis.

Other examples of how research and information related to wilderness is emerging and contributing to the global network of information can be found in such countries as India (Chhabra, 2001), Italy (Zunino, 2001) and Cuba (Estrada & Puga, 1998). This study is intended to become part of the emerging body of information and research directly related to visitor management for wilderness areas in South Africa.

2.4 South African Context

South Africa has a long and prestigious history of formally protected-areas. The first protected area in Africa was established in Zululand in 1895 (Bainbridge, 2001:a). In the following century approximately 422 individual areas were proclaimed in South Africa, totalling to an estimated 6.7 million hectares or 5.5% of the terrestrial land of the country (Bainbridge, 2001:a). Of the 6.7 million hectares 466,330 hectares is designated or being considered as wilderness. Consequently, wilderness accounts for less than 0.5% of the land in South Africa (Bainbridge, 2001:b). However, this small percentage of land plays a vital role in the protection of special status species and as a unique setting for wilderness dependent activities as have been previously mentioned. Within the South African wilderness system the case study site, the Mlambonja Wilderness area is of unique importance as previously discussed.

Given the value of these unique wilderness areas and the increasing pressures on them as shown in section 1.4, it is of great importance that the body of wilderness-related information and research specific to South Africa be further developed. This information needs to be developed because as MacDevette (1994, p2) states “(i)n any comprehensive management process, information is used to provide the background for informed decision taking at the strategic level as well as for the monitoring of progress on actions implemented.” Even within the international body of knowledge specific areas have been identified as needs within research. As Krumpke (2000, p11) explains “(s)cience should also contribute to better wilderness planning by studying various aspects of the planning process itself.” As a result, it is the intended focus of this study to provide a better understanding of these processes.

2.5 Influential Legislation and Policy

In this section the legislation and current policy that affects the management of the case study site is discussed. It is not the intention of this section to discuss exactly how this legislation and policy relates to every aspect of management of wilderness, but rather those elements that relate directly to the need for protection of wilderness resources: who has the authority to do this and what rationale, if any, there is for information and

education programs in the management process. It is acknowledged that particular emerging national legislation, the Protected Areas Bill and Biodiversity Bill, will have important implications for wilderness managers in South Africa in the future. The Biodiversity Bill, as it relates to this study, is mainly concerned with the need to develop comprehensive management plans on a variety of scales in order to conserve biodiversity. As this is already happening in the wilderness areas of the UDP there will be limited discussion given to this particular piece of emerging legislation. However, the Protected Areas Bill has a high potential of being relevant but not in its current state. The highly unstable nature of these bills in their current developmental stage does not render them useful as a guide for current management strategies or plans. For example, at one point a South Africa specific definition for wilderness was provided in the draft Protected Areas Bill. However, wilderness as a concept and all other related information was removed from the subsequent draft version. After public comment it has been implied that the wilderness information will be put back in (Densham *pers com*, 2003). Clearly, the highly volatile Protected Areas Bill can do little to inform this study or wilderness managers until it becomes more stable. In addition, it is highly likely that any specific discussion given to what is included in the current draft version of this bill would be outdated by time this paper is completed. However, it is useful to this study to look at what elements are missing from current legislation that this bill should address if visitor management is going to be successful on a long-term basis. This will be discussed further in section 2.5.2.

Legislation and policy is considered at three levels, the international, national and provincial level. In essence, the international agreements provide the “why” for wilderness managers and formally recognise the unique and important natural and cultural values within South Africa. National level legislation is the “what” and “who” of wilderness areas. It gives definitions for each category of protected area, who has the authority for management of them and enacts international agreements. The provincial level gives effect to “how” those protected areas will be managed, mainly in the form of policies.

2.5.1 International

On the international level, the wilderness managers in the UDP are bound to primarily three international agreements; the RAMSAR convention, the World Heritage Site listing of the UDP and the UN Convention on Biological Diversity. A fourth agreement exists between South Africa and The Kingdom of Lesotho, the Maloti-Drakensberg Transfrontier Conservation Development Area, but it is still in the formative stage. As a result, it will not be discussed in detail. The primary agreements provide additional rationale for the wilderness values within the UDP, as well as the need for effective management approaches to achieve compliance with the obligations set out in each.

The first agreement is the RAMSAR convention. The Natal Drakensberg Park, now known as the UDP, was officially listed as a RAMSAR site on the 21st of January, 1997 and consists of 242, 813 ha. The park protects the three largest rivers in the province of KwaZulu-Natal. These rivers are the Tugela, Mkhomazi and the Mzimkulu. It is estimated that the value of the water produced in the park is roughly R150 million per annum, as rural and urban areas as well as agriculture and industry use it (Dini, 1999). This listing gave formal international recognition to the high yield and quality of the fresh water resources in the area. As a party to the RAMSAR convention land managers in the area are bound to promote and manage the conservation and “wise use” of the wetlands within the area (Glazewski, 2000 p59). This includes the impacts from visitors in these areas such as erosion, waste disposal and litter. Thus, South Africa’s member party status to the RAMSAR convention implies a need for comprehensive visitor management.

The second international agreement that impacts the management of the wilderness areas in the UDP is the World Heritage Site listing. The UDP was listed as a mixed World Heritage Site in December of 2000. Previous discussion of the importance of this mixed listing is found in section 1.4. With this listing came recognition of the international natural and cultural values of the UDP. With this recognition came responsibility as each member party agrees, “ to ensure that effective and active measures are taken for the protection, conservation and presentation of the natural and cultural heritage situated in

the territory...” (Glazewski, 2000 p388). Thus making it explicit that active measures need to be taken to both protect and provide access. This is the very crux of visitor management as will be discussed further in later sections. This illustrates a clear responsibility for wilderness managers to develop management strategies and plans to address the impacts of visitors on the natural and cultural resources of the UDP.

The third international agreement that provides rationale for the wilderness values and need to manage them appropriately is the UN Convention on Biological Diversity. Essentially, as it relates to this study, this agreement signed by South Africa and ratified in 1993 maintains that the elements of biodiversity will be managed according to objectives set forth by the convention. Specifically, the convention requires member parties to “develop national strategies, plans and programmes for the conservation and sustainable use of biological diversity and to integrate these as far as possible into relevant sectoral programmes” (Glazewski, 2000 p 302). This implies that wilderness managers must develop visitor management strategies to manage negative visitor impacts to the biological resources of the area.

2.5.2 National

The national legislation is primarily concerned with the “what” and “who” of wilderness areas in South Africa. The initial piece of legislation dealing specifically with wilderness in South Africa was the Forest Act (no.72 of 1968) as amended in 1971. This Act gave wilderness formal recognition as a form of designation in the South Africa. Subsequently, the National Forests Act (no. 84 of 1998) repealed the previous legislation but did allow for areas designated under the previous legislation to remain designated as wilderness areas under the savings provision of the act. The National Forests Act (no.84 of 1998) is the current legislation giving legal protection for wilderness areas. Unfortunately, this piece of legislation only provides that the Minister may declare a “forest wilderness area” (Glazewski, 2000). There is no legal definition for wilderness provided. Nor is there any information on what a forest wilderness area is defined as, if an area can be a wilderness if it does not contain a “forest” or how it should be managed.

This is where the emerging Protected Areas Bill has a very important and needed role to play.

For wilderness management to be successful on a long-term basis in South Africa three things are critical. The first critical component is that a South African specific definition of wilderness needs to be legally established. This will help to solidify what wilderness means in the South African context, not in the generic and incomplete global context now being used with the IUCN definition. The second critical component is what the characteristics are of a wilderness area in South Africa. This will allow for new potential wilderness areas to be identified, but more importantly, it will make explicit for managers what characteristics are to be managed for, thus defining the South African context of wilderness values, resources and benefits. Without this higher level definition, there is no way of establishing consistency of wilderness management between various conservation organizations. This makes it difficult to discuss wilderness on any sort of national level. The third critical component that needs to be addressed in the emerging Protected Areas Bill is some sort of guidance as to how wilderness areas should be managed. This is indirectly addressed in part by the emerging Biodiversity Bill and its mandate for systematic planning but more is needed. Currently, wilderness management in the UDP stipulates the use of management practices such as a “minimum tool” approach as an implied policy. However, without legal mandates this implied policy is left to an extremely wide range of interpretations and inconsistency between conservation agencies or management. Clearly, as the Protected Areas Bill becomes more stable it must include these three critical components in order to ensure that wilderness management is going to be coordinated and effective on a long-term basis in South Africa.

It is also important that this study briefly look at the other related legislation and policy. While they are not as directly related to wilderness they do indirectly relate to the resources and values of wilderness areas. A brief understanding of their role illustrates the depth of the rationale and need to effectively manage the wilderness resources and values within South Africa and the visitor impacts to them. These related pieces of

national policy and legislation as well as their implications for wilderness managers in South Africa are summarised in Table 2.1.

Table 2.1 Additional related national policy and legislation (*adapted from UDPWMP, 2003*)

Related National Legislation	Brief Description
<i>The National Water Act No 36 of 1998</i>	Authority for the nations aquatic resources to be protected. This includes both quantity and quality. The Act also gives authority to secure ecological reserves in addition to human use.
<i>The National Monuments Act No. 28 of 1969</i>	Seeks to preserve and protect the historical and cultural heritage of South Africa.
<i>National Environmental Management Act No 107 of 1998 and The Environment Conservation Act No. 73 of 1989 as amended</i>	Provide a framework for integrating good environmental management into all development activities. As well as, the protection and controlled utilization of the environment. In particular, protecting natural ecological processes against harm caused by human activities. This Act promotes environmental education and the effective management of cultural resources, and the co-ordination of integrated environmental management programmes. In addition, impacts for proposed developments as assessed.
<i>White Paper on a National Environmental Policy for South Africa</i>	Ensure the protection and / or sustainable utilization of all natural resources in the country and also supports ratification of international conservation conventions including the designation of World Heritage Site properties and the conservation of biodiversity.
<i>White Paper on the Conservation and Sustainable Use of South Africa's Biodiversity</i>	Gives effect to South Africa's obligation to implement in accordance with the United Nations Convention on Biological Diversity objectives as well as to develop national strategies, plans or programs to address the conservation and sustainable use of biodiversity into policies and plans.

2.5.3 Provincial

The provincial level is mainly where the “how” of wilderness management is defined. This is achieved through provincial legislation but mainly through the development of policy and management plans. The main focus of this section is the current draft version of the uKhahlamba-Drakensberg Park Wilderness Management Plan (UDPWMP), but it

is important to acknowledge the important role that two other provincial pieces of legislation make for the “what” and “who” of formally protected areas in KwaZulu-Natal. The first is the KwaZulu-Natal Heritage Act (no.10 of 1997). This act provides for the establishment of a management body for provincial natural heritage sites, which may be included in a wilderness area. An example of this is the San rock art sites found within the wilderness areas of the UDP. It also sets up educational, training and frameworks for tourism-related projects in the province, giving further support to information and education programs as an effective and preferred management technique. Secondly, the policies for nature conservation in KwaZulu-Natal should be acknowledged. These are given in full in Appendix C. The implications for these policies are wide-ranging. Essentially, they set out the vision, mission and intended ways to fulfil them. In general, these lend further support to the need for effective management, awareness and long-term solutions. However, a detailed discussion would distract from the narrow focus of this paper, wilderness management within the UDP. The following discussion is focused on the most current draft version of the UDPWMP, which was released on March 4, 2003.

Currently, managers of the UDP are in the process of developing a wilderness management plan comprising of two parts, the general UDP plan and any area-specific plans that need to be developed. The previous version of the Cathedral Peak plan was drafted in 1985 and is relatively outdated. While some major themes remain, the current version is being drafted in an effort to update management strategies of current management frameworks and practices. There are two new management issues in the current version that are relevant to the discussion of this study from the UDPWMP. The first management issue is the recognition of a future increase in visitors to the Mlambonja Wilderness area as a result of increased marketing of the World Heritage site and MDTCDA. It is the intention of EKZN Wildlife to increase their marketing efforts of these two areas in order to increase visitation. This is evidenced by the recent opening of a 140 bed camp, conference centre and soon to open San Art Interpretive Centre all located only a few kilometres from the Mlambonja Wilderness Area boundary. This illustrates the urgency around the need to develop preventative and effective visitor management strategies. The second point that specifically informs this study is the role

of education as a management strategy in the draft wilderness management plan. Section 25 of the UDPWMP is titled “Awareness Program”. In this section education goals are set out for four particular areas, staff, neighbours, the public at large and the public users of the wilderness areas. The discussion of the first three groups is mainly related to training and other goals that are beyond the scope of this study. However, the mention of public user groups is extremely relevant to this study and provides important support for the development and use of a proposed information and education management framework. Likewise, management in the UDP support studies such as this one in order to support those user groups (Krueger *pers com*, 2003).

Section 25.4 of the UDPWMP titled “Public (at large)” is divided into three parts. The full contents of this section can be found in Appendix D. Part one identifies the goal of providing a two-day basic wilderness-training course to a range of people, including schoolteachers; trail guides, the hotel trade and others. This will help to achieve the goal of providing wilderness education to the public users through the wider range of professionals they come in contact with. Part two identifies specific goals for educational materials. These goals are listed in Table 2.2.

Table 2.2 Education goals of the 2003 draft version of the uKhahlamba-Drakensberg Wilderness Management Plan (UDPWMP, 2003)

Wilderness Education Goals

- 1 Literature must be placed at the gate. Perhaps also given to people when they make reservations.
 - 2 A section on wilderness should be included on the back of the hiking maps. People must be included- It must be clear that wilderness includes people.
 - 3 Provide an interpretive display on the UDP Wilderness Area at the main camps. These will include a series of panels i.e. for fire management, wilderness, rock art etc.
 - 4 Basic interpretive material must be available. Integrated interpretation.
 - 5 Pamphlets- on the do's and do nots in wilderness e.g. toilet hygiene- squits and squats and Leave no Trace principles. Pamphlets should include a definition and vision as well as general regulations (group size, safety, fire).
 - 6 Provide the user with useful interpretive material on wilderness values, ethics, etc, which would include education materials and no-trace camping ethics, etc, (provide a spectrum of wilderness education).
 - 7 The emphasis will be on improving understanding of the wilderness code of ethics, rather than regulation enforcement. Regulations must be presented in a positive, simple manner. Law enforcement should be provided at a level commensurate with the wilderness objectives and situation.
 - 8 Guided trails should enhance wilderness awareness by developing and expanding on the aims and objectives of wilderness through practical demonstration.
-

Upon examination, these education goals illustrate a very important issue. This issue is what areas are of specific focus for wilderness managers within the UDP at this point in time. These are things that may have been introduced to the draft plan by managers based on experiences in the field, input from literature or items that are based on visitor feedback. However, managers can use these education goals to compare against the proposed information and education management framework criteria to reveal important areas that are not being currently considered. This is an essential element of active and/or adaptive management strategies. That is to say, management strategies that are

constantly evaluating their strengths and weakness in order to improve their effectiveness in addressing management issues.

The last part of section 25.4 from the UDPWMP is titled “Actions”. This part illustrates two actions that should take place for the process of accomplishing the previously mentioned education goals to begin. The first action is to “obtain the existing pamphlets and see what’s missing. Incorporate the wilderness information into the existing one. Must prioritise the information that we can get across in these pamphlets.” (UDPWMP sec 24.5). The second action is to seek out appropriate funding sources. It is important to note that these two actions are not sufficient to accomplish all the education goals that have been set out in draft wilderness plan. The use of the proposed management framework to understand and structure the wilderness information system could help define more action steps. What the current actions steps do make explicit is that an inventory of the existing materials is needed in order to effectively implement the draft management plan. Thus, further illustrating the need and importance of the development and use of a systematic approach to managing information and education programmes for visitor management purpose in the wilderness areas of the UDP.

It becomes clear from the education goals and proposed action steps which areas and forms of educational materials are currently seen as a priority for the wilderness managers within the UDP. These elements will be used to inform the development and refinement of the proposed information and education management framework. They will be used in conjunction with the larger body of related literature in order to ensure the developed and refined elements of the proposed information and education management framework are as inclusive as possible. This will enable the proposed information and education management framework to evaluate management’s successes and shortcomings of progress towards their recognized goals and identify new ones.

With an understanding of the mandates on the international, national and provincial level it becomes clear that there are many driving forces for wilderness managers in the UDP to use education for visitor management purposes. Given the diversity of cultural and natural values of the area recognized at a variety of levels and the organizational push to attract more visitors, there is an extremely high level of urgency to develop visitor management strategies focused on long-term solutions.

Chapter 3

Establishing a Conceptual Foundation for Wilderness Visitor Management

Three theoretical areas, as previously mentioned, have primarily informed this study. Once again, these areas include wilderness management, environmental education and interpretation and behaviour modification. It is acknowledged that each of these theoretical areas on their own are vastly complex and their topics diverse. The following discussion intends to synthesise the information in these areas that specifically inform the development of a proposed information and education management framework within a South African context.

3.1 Behaviour Modification

Behaviour modification is a theoretical field that is built on theories from psychology, sociology, communication studies and more. It contains many theories, some opposing and divergent in their assumptions and implications. For the purposes of this study two behaviour modification theories, Social Cognitive Theory and the Theory of Reasoned Action, are summarized and their implications for this study discussed. The rationale for selecting these two theories is based on two criteria. The first criterion is that a review of the research and literature related to the other contributing theoretical areas indicated that these two theories are often used as a foundation for newer and emerging theories (Gunderson, Barns, Hendricks, McAvory, 2000). The second criterion is that both theories view the individual as an active participant as a cognitive being that has an active role in the process of behaviour modification. This is important because in a wilderness setting visitors are not considered a captive audience. They play a very active role in the process of behaviour modification. It is essential then that this assumption be built into the theories guiding the development of the proposed information and education management framework criteria. A more detailed discussion of Social Cognitive Theory and the Theory of Reasoned Action are provided below.

3.1.1 Social Cognitive Theory

Social Cognitive Theory is accredited to Albert Bandura (Brown, 1998). It is largely founded in the field of psychology merging the works of behavioural and social physiologists (Brown, 1998). Social Cognitive Theory serves two main purposes. The first is to understand and predict individual and group behaviour. The second is to identify methods in which behaviour can be maintained, modified or changed.

Social Cognitive Theory is based on three main characteristics. The first characteristic is that “Social Cognitive Theory’s strong emphasis on one’s cognition suggests that the mind is an active force that constructs one’s reality, selectively encodes information, performs behaviour on the basis of values and expectations, and imposes structure for its own actions” (Brown, 1998 p4). This is strongly aligned with wilderness philosophy, which places strong emphasis on self-reliance and freedom of action. The second characteristic is that Social Cognitive Theory suggests that most behaviour is learned vicariously (Brown, 1998). The concept of vicarious learning is explained in greater detail later in this section. The third characteristic is that Social Cognitive Theory defines human behaviour as being a result of triadic reciprocity. That is to say that behaviour, personal factors (values, attitudes and beliefs) and the environment all act as influencing determinants of each other (Bandura, 1986). Within Social Cognitive Theory the nature of a person is defined by several key constructs. A brief description of these key constructs is provided in Table 3.1. This illustrates the complexity and diversity of issues to be considered when designing, planning and using the proposed information and education management framework.

Table 3.1 Key constructs of Social Cognitive Theory (*adapted from* Bandura, 1986)

Construct	Brief Description
Symbolizing Capability	People use symbols to process and transform transient experiences into internal models that serve as guides for future action.
Forethought Capability	People anticipate the likely consequences (positive & negative) of their prospective actions, they set goals for themselves, and plan courses of action.
Vicarious Capability	The capability to learn by observation in order to acquire rules for generating and regulating behaviour patterns.
Self-Regulatory Capability	The capability to motivate and regulate behaviour based on internal standards and self-evaluations of personal actions.
Self-Reflective Capability	The capability to reflect on information and one's experiences to generate knowledge about themselves and the environment around them.

In addition to the fundamental aspects of Social Cognitive Theory there are four other important contributions that it makes to inform this study. Firstly, that “motivation is crucial for behavioural change” (Bandura, 1969 p225). If a person has no desire to change their action, they will not. This has implications for wilderness managers as it illustrates the power of using incentives in the proposed information and education management framework. Secondly, the use of negative reinforcers generally addresses a person’s tendencies and is less effective at adjusting the key constructs of Social Cognitive Theory mentioned in Table 3.1, which are seen as the forces behind action (Bandura, 1969). Essentially, addressing symptoms is a short-term solution as opposed to addressing the real issue of long-term behaviour change. For wilderness managers this has very important implications in what type of educational technique is used. Very closely related to this point is the third additional contribution that Social Cognitive Theory makes to inform this study. The third contribution is that once behaviour is internalised “ a person’s conduct is presumably guided by inner values rather than by compliance with external demands and outcomes” (Bandura, 1969 p615). What this

means for wilderness managers is that the amount of restrictions on wilderness visitors can be reduced because they will manage themselves, which is the preferred situation for long-term solutions. Lastly, Social Cognitive Theory contributes important factors to consider in order to stabilize behavioural changes once they occur. Managing the stabilization of changed behaviour can be achieved through three methods. The three methods are transfer training, alteration of the reinforcement and the establishment of self-regulatory practices (Bandura, 1969). What this contributes to the study is an understanding of available methods to stabilize behavioural changes once they have occurred.

Wilderness managers can use the contributions of Social Cognitive Theory to consider what methods are most appropriate to pursue given the constraints they operate within. Consequently, if wilderness management in South Africa is going to be successful in the long-term it must work towards management practices that are cost effective, in line with wilderness philosophy of being non-restrictive and protect wilderness resources and values. The most effective approach to accomplish this is to get wilderness visitors to self-regulate. If this is to be accomplished, effective elements of the proposed information and education management framework must focus on the driving forces behind behaviour and not only the behaviour itself.

3.1.2 Theory of Reasoned Action

The Theory of Reasoned Action is primarily attributed to work done by Martin Fishbein, Icek Ajzen and Michael Manfreda (Ham & Krumpe, 1996). This theory is founded in the field of social psychology and is primarily based on the assumption that behaviours are the result of the interaction of beliefs, attitudes, and intentions. The main purpose of this theory as a contribution to this study is to aid wilderness managers in the design of interventions to replace, alter or maintain target behaviours. Figure 3.1 illustrates a framework that is useful for understanding the concepts of the Theory of Reasoned Action and their relationships. This is followed by a more detailed discussion of each of the major elements.

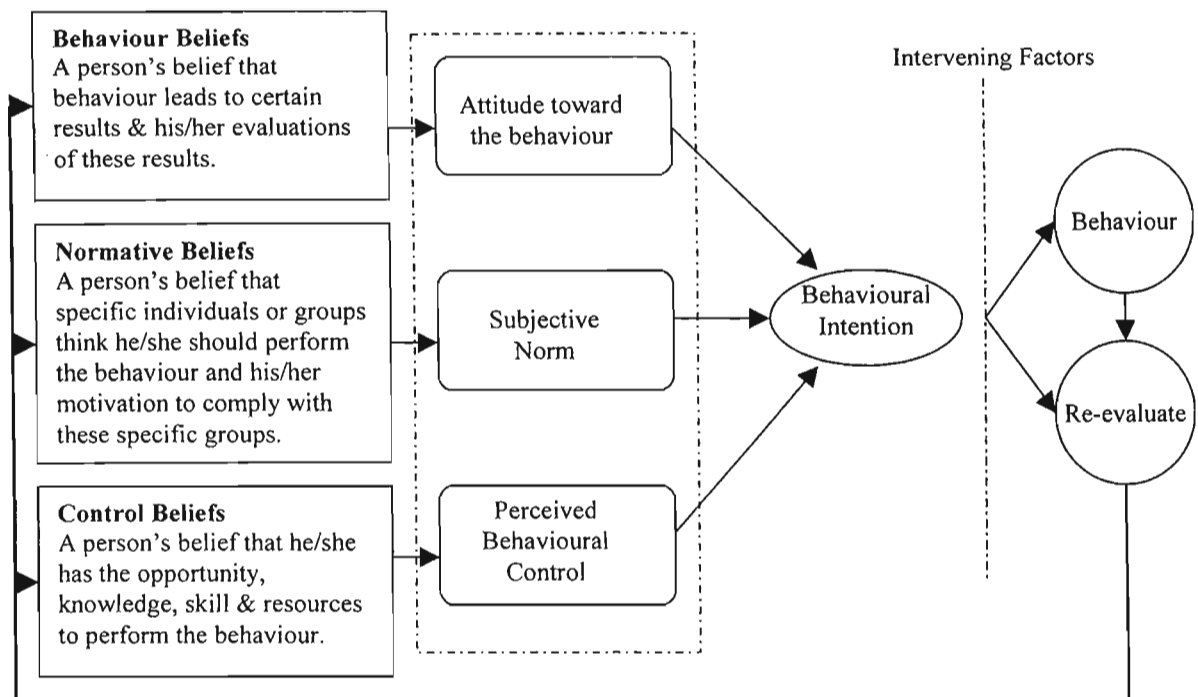


Figure 3.1 Framework for the Theory of Reasoned Action (*adapted from Ham & Krumpe, 1996*)

Beliefs

Fishbein and Ajzen (1975, p131) define beliefs as “ the subjective probability of a relationship between the object of the belief [the wilderness visitor] and some other object, value, concept or attribute.” It is important to note that the Theory of Reasoned Action does not view beliefs as a homogenous idea. In fact, there are three types of beliefs to be understood and considered. The first are behavioural beliefs, which are connected to the perceived outcomes of behaviour. Secondly are normative beliefs, which are based on perceived social pressures to perform or not perform certain behaviours. Lastly, control beliefs are based on the perceived level of volitional control over behaviour (Ham & Krumpe, 1996). It is important for wilderness managers to understand the role of all three types of beliefs and the important role they play in shaping the attitudes of visitors to wilderness areas.

Attitudes

A definition of an attitude is a “person’s general feeling of favourableness or unfavorableness toward a stimulus object” (Fishbein & Ajzen, 1975 p216). This definition has very important implications for wilderness managers. It illustrates very clearly the vital role of attitudes and beliefs, between the behaviours of wilderness visitors and management practices (the stimulus object). For example, informing visitor attitudes toward litter will generally be more effective than instituting a fine for littering. It also illustrates how complex the development of intentions for behaviour is. The process of developing education techniques to understand and influence them should not be taken lightly.

Intentions

Once again Fishbein and Ajzen (1975, p288) provide a valuable definition for intention as “a person’s subjective probability that he will perform some behaviour.” It is important to note, as is true for the previous two definitions, the role of subjectivity and perceptions. Wilderness visitor’s behaviours are driven by their perceptions, not necessarily by factual reality. This implies that in an ideal situation the proposed information and education management framework should be complimented by a solid foundation of research and information related to visitors perceptions. As Ham and Krumpal (1996 p17) point out “resource managers often make the mistake of designing messages that contain only important factual information concerning the behaviour they desire people to change. What they fail to do is consult the intended recipients of the message to identify which of their beliefs really influence how they behave in the particular situation.” For example, it would be more effective to understand why wilderness visitors chose to use open fires in the overnight caves and then address those perceptions as opposed to simply informing wilderness visitors that fires are illegal. This point has significant implications for wilderness managers, especially during the early stages of the proposed information and education management framework as discussed in later sections.

The interaction between beliefs, attitudes and intentions illustrates the role that education has in the behaviour modification process. Figure 3.1 clearly illustrates at what point in the behaviour modification framework education and information (intervening factors) can play a role. Figure 3.1 also illustrates the two main influences of the Theory of Reasoned Action framework for the proposed information and education management framework. If a wilderness visitor's intentions are in line with the information presented they will most likely act upon their intended behaviours. After which the experience will feedback into the process. If however there is inconsistency between the visitor's intended behaviour and the information provided a re-evaluation might take place and the entire process will begin again.

Valuable contributions are made to this study from an in-depth investigation of Social Cognitive Theory and the Theory of Reasoned Action. Both theories of behaviour modification provide valuable guidance for the development of the proposed information and education management framework. There are three main themes that can be taken from these theories to strengthen this study. The first theme is an understanding that maintaining or modifying wilderness visitor behaviour is a complex issue. Thus, providing more support for a systematic approach of managing wilderness information and education systems. The complexity of the issue also implies that significant behaviour modification takes time. It would be unrealistic to expect immediate dramatic changes in visitor behaviour. The second theme is that actions are the result of underlying forces, knowledge, skills attitudes and beliefs and they should be the focus of visitor management strategies. The third theme is that the underlying forces are not based solely on factual information but mainly visitor's perceptions. This illustrates how important it is that wilderness managers make efforts to understand those perceptions, as they are far too important to leave to assumptions.

3.2 Wilderness Visitor Management Theory

It is important that a definition for wilderness management be given to ensure that the underlying assumptions of what is being discussed are explicit. For the purposes of this study the definition provided by Hendee and Dawson (2002, p12) is used. They define wilderness management as the application of “concepts, criteria, guidelines, standards and procedures derived from the physical, biological, social and management sciences to preserve naturalness, outstanding opportunities for solitude or primitive, unconfined recreation and provides stewardship and protection of resources and values in designated wilderness areas.” From this broad definition this study focuses on the visitor management aspect of wilderness management as opposed to resource management or community outreach programmes. For the purposes of this study visitor management will be defined as the management practices that focus on managing the impact of wilderness visitors on the resources and values of wilderness areas. With this foundation set, a closer examination of the literature reveals three major areas of visitor management in wilderness management that inform this study. These areas include the type of management techniques used, the role of education for visitor management and the areas that have been identified as points necessary for further development in visitor management. It is also important to acknowledge at this point it is important to consider that the role of on-site (visitor centres, trailhead signs, *etc.*) and off-site (school programs, community outreach, *etc*) management efforts. For the purposes of this study the off-site techniques have been identified as beyond the scope of the study as mentioned in section 1.7.

3.2.1 Indirect versus Direct Management Techniques

Management practices can be divided into two major categories, direct and indirect . It is important to first make clear the difference between the two. Figure 3.2 illustrates and Hendee and Dawson (2002 p472) explain that “direct management emphasizes regulation of behaviour by restricting individual choices as managers exert control over visitors.” This is as opposed to indirect management, which “emphasizes influencing or modifying behaviour by managing factors that influence visitor’s decisions”. Examples of direct management practices are fines, reservation systems and regulations. Examples of

indirect management practices include education programs, trail quota systems and zoning.

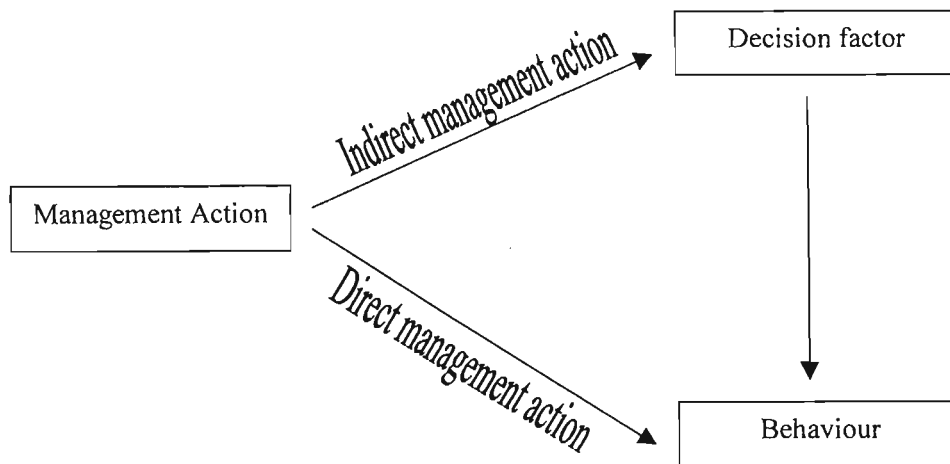


Figure 3.2 Intended impact of indirect versus direct management practices (Manning & Lime 2000)

As Manning and Lime (2000, p31) indicate, “(g)enerally, indirect management practices are favoured when and where they are believed to be effective. This is particularly true for wilderness and related types of outdoor recreation opportunities.” However, education and other indirect management techniques are not always the most appropriate choice. Table 3.2 illustrates the potential effectiveness and limitation of using the indirect management technique of education and information. This is important to note as it shows that direct management techniques can be more effective when immediate action is needed to halt the impacts of illegal, uninformed and unavoidable visitor use. This helps to answer the question of what issues should be included in an information and education programme. However, “indirect management should be the first choice, with direct management used only when indirect means cannot achieve management objectives” (Hendee & Dawson, 2002 p472). The implication of these two approaches is particularly important for wilderness management, as one of the unique characteristics of wilderness is the sense of freedom and choice. It has also been shown that for the same reasons visitors prefer indirect management techniques. Since indirect management techniques are the preferred choice of both managers and visitors education may be the most important wilderness management technique (Manning & Lime, 2000).

Table 3.2 Use of education and information for recreation management problems

(adapted from Manning & Lime, 2000)

Type of Problem	Example	Potential Effectiveness of information and education
Illegal	Theft of Native American artifacts. Invasion of wilderness by motorized off-road vehicles.	low
Careless Actions	Littering. Nuisance activities (e.g. shouting)	moderate
Unskilled Actions	Selecting improper campsite. Building improper Campfire	high
Uninformed Actions	Selecting lightly used campsite in the wilderness. Using dead snags for firewood. Camping in site or sound of other party.	very low
Unavoidable Actions	Human body waste. Loss of ground cover vegetation in campsite.	low

General wilderness management theory provides a credible context into which application of the ideas contributed by the behaviour modification information in section 3.1 may be initiated. With an understanding of the role of education in wilderness management it will become clear how the two areas complement each other and need to be used in conjunction if success of visitor management in wilderness areas is to be achieved.

3.2.2 Role of Education in Visitor Management

For the purposes of this study, education programs for visitor management are defined from the manager's perspective as a form of management tool. Thus, information and education programs are defined as management tools used for the purposes of persuading visitors to adopt behaviours that are compatible with management goals and objectives (Manning & Lime, 2002).

It is now clear what education programs are defined as in the context of this study and the reason why they are preferred. However, it is important to look at the literature to see what research has been done to evaluate what types of education are effective or preferred by wilderness managers. An understanding of this will have a substantial contribution to the development of the proposed information and education management

framework in South Africa, as it will allow for better-planned use of materials based on other experiences. In 1993 a survey of wilderness managers in the United States evaluated the use and perceived effectiveness of 25 visitor education techniques. The results of this survey are shown in Table 3.3.

Table 3.3 Use and perceived effectiveness of 25 education techniques in wilderness areas (Manning & Lime, 2000)

Technique	Percentage Used	Mean perceived effectiveness rating*
Brochures	74	2.5
Personnel at agency office	70	2.7
Maps	68	2.1
Signs	67	2.3
Personnel in backcountry	65	3.8
Displays at trailheads	55	2.6
Displays at agency offices	48	2.7
Posters	48	2.3
Personnel at school programs	47	2.9
Slide Shows	36	2.9
Personnel at campgrounds	35	2.9
Personnel at public meetings	34	2.8
Personnel at trailheads	29	3.3
Personnel at visitor centres	26	3
Videos	21	2.6
Agency periodicals	18	2.3
Display at visitor centres	18	2.5
Guidebooks	13	2.5
Interpreters	11	3.6
Computers	11	1.9
Commercial radio	9	1.9
Commercial periodicals	8	2.4
Movies	7	2.6
Commercial television	4	2.3
Agency radio	1	2.4
Means of personnel-based techniques		3.1
Mean of media-based techniques		2.4
Mean of all techniques		2.6

* Effectiveness scale: 1= "not effective; 5= "highly effective"

Two very important lessons emerge from this survey to inform the development of a proposed information and education management framework. The first lesson is that the majority of wilderness managers in the United States use only six of the 25 techniques. The six education techniques are brochures, personnel at agency desk, maps, signs, personnel in the field and displays at trailheads. The reasons for this are not explicitly stated but it can be inferred that it would have to do with the realities of limited resources, practicality of use of the various techniques and available funding. It would also be reasonable to assume that the preference for these six education techniques is related to trial and error over time as a management technique in wilderness areas. The second lesson that can be learned from this survey and applied to the development of the four elements of the proposed information and education management framework is that the personnel-based techniques are generally perceived as more effective than the media-based techniques (Manning & Lime, 2000).

It is also critical to consider the negative case for education as a management technique. Some studies have shown that education material may not increase visitor knowledge. This however can be attributed to a variety of factors such as high levels of prior knowledge and compliance with regulations. Table 3.2 also indicated that under certain circumstances direct management practices are more appropriate. Clearly, more information is needed about the use and impact of education techniques for visitor management.

3.2.3 Identified Needs of Visitor Management: Education Techniques

The literature indicates that there are two major areas where further investigation is needed to better understand the use and effectiveness of education as a visitor management technique. The two areas are the planning process for information and education systems and monitoring of these programs and systems. The two are very closely linked. If a systematic approach is taken in the planning process monitoring can be used to evaluate the effectiveness of those processes over time. Thus, allowing the processes to be informed and refined.

Planning Process

Wilderness managers are constantly in the process of problem solving. As the definition of education programs explains, they are challenged to persuade wilderness visitors to comply with management goals and objectives. As Stankey (2000 p22) explains, “(s)ound processes for problem-framing are the first step to effective problem-solving”. This clearly indicates the need to take a closer look at the processes behind the planning, development, inventory and refinement of education programs. This has important implications for this study as it informs focus selection. The development of the proposed information and education management framework is done in an effort to better understand and refine the planning process.

Monitoring

The wilderness management literature points to the extreme importance of monitoring to improve wilderness management (Cole, 1993; Cessford, 2000). Monitoring is important because it takes into account the dynamic nature of wilderness management. As a continual process it permits planning systems and approaches to adapt and improve as new information is gained and valuable lessons of failure learned. This is an essential step in the overall process to ensure that management techniques and particularly education programs contribute to the determination of long-term solutions for visitor use issues.

Currently, relatively little is known about the effectiveness of visitor education (Buckley, 2000). This study can serve as an important first step in the process of developing this better understanding by proposing a management framework for managing wilderness information and education systems in the Republic of South Africa. With this foundation in place research and investigation can be done to evaluate the effectiveness of that system and the individual materials within it.

3.3 Environmental Education and Interpretation Theory

Many of the elements of environmental education and interpretation have been discussed or implied in the previous sections, such things as what education is defined as in this context, how it is used and when it is appropriate. For this reason this section will focus more specifically on other points that environmental education and interpretation contribute to the development of the proposed information and education management framework in South Africa. These points should contribute significantly to the understanding of why education is so valuable, how to develop education materials and what is needed for education programs to be successful. Each of these areas is discussed in greater detail below.

3.3.1 Value of Education

The literature illustrates the value of education based on two points. Firstly, there is a pressing need for education. Secondly, studies have shown education to be effective in achieving education's ultimate goal, "shaping human behaviour" (Hungerford & Volk, 1990 p8). A clearer understanding of these two points serves as a strong foundation for understanding how to develop a successful education program.

The need for education can be seen in earlier examples provided in this paper. The increased levels of demand on wilderness areas discussed earlier in this paper illustrated how increasingly important it is that managers strive to keep visitor behaviour inline with management goals and objectives. The increase in wilderness visitors not only means an increase in numbers but also a widening range of knowledge, skills and attitudes. As Hanna (1995 p23) explains, research has indicated that if a wilderness visitor is uninformed about the appropriate rationale and skills needed for "environmentally conscious wilderness behaviour" even the well intentioned may make inappropriate behavioural choices. It is the potential negative impacts to the wilderness resources and values from uninformed wilderness visitors that drive the growing need for education.

The second point of the value of education is in its demonstrated effectiveness. As previous examples such as table 3.2 and 3.3 illustrate, in appropriate circumstances

education has proven to be an effective management tool. Zeleny (1999) undertook a meta-analysis study of 18 education interventions, both in school settings and in non-traditional settings. This study found that educational interventions effectively improve environmental behaviour, and provided evidence to support managers perceptions of educational materials effectiveness to modify visitor behaviours.

3.3.2 Development of Education Materials

The body of literature from environmental education and interpretation provides key information about what is needed to effectively develop education materials. This information is used to inform the development the proposed information and education management framework in South Africa. This will allow the proposed information and education management framework to be used as a management tool to develop, evaluate and improve education systems and materials in South Africa. The literature illustrates that the development of education materials is best accomplished as a two-step process. The first step is to understand your audience and the second is to develop an education message specific to them.

If the ultimate purpose of education is to change visitor behaviour the first step in the process should be to understand what drives visitor behaviour in the first place. A detailed discussion of this was given in the section 3.1. Essentially, managers need to understand the elements that drive visitor behaviour because this information is essential to the development of effective education materials. This information can be gathered through use of surveys, feedback forms and workshops with relevant stakeholders. The type of information to be gathered should include information that is related to visitor knowledge and skill levels as well as attitudes and beliefs. Examples of such information include education levels, experience level, attitudes toward low-impact practices and an understanding of wilderness regulations. In the early stages of an information and education program it might not be possible to wait to gather all this information. At first, funding and time might make it necessary for managers to make some assumptions about wilderness visitor's characteristics and move onto the second step of the process. However, if the proposed information and education management framework is going to

be successful in the long run, it is considered essential that this element be added into the program in order to evaluate and improve the education techniques used. With an understanding of the visitor characteristics it is now possible to move onto the second step of developing education materials.

Before education techniques are designed, careful consideration must be given to the type of audience for which they are being developed. In the case of wilderness education materials the majority of them are for a non-captive audience. That is to say audiences that can “freely choose to attend or ignore communication content without fear of punishment or forfeiture of reward” (Ham & Krumpal, 1996 p12). This has important implications for how the materials should be developed as opposed to those that might be used for staff training, agency publications or strict informational pamphlets. The literature points to three major issues to be considered when developing education materials for non-captive audiences. The first issue is the attractiveness of the message. The second is the relevance of the message and the third is the use of descriptive versus injunctive norms in the content.

As has been previously stated wilderness managers are dealing primarily with a non-captive audience. For this very reason it is important that education materials be attractive and relevant to the visitor in order to hold their attention. An example of this comes from a study done on the effectiveness of information on trailside bulletin boards (McCool & Cole, 2000). This study was founded on the assumptions that effectiveness of education materials is directly linked to whether or not visitors stop to look at the messages and how much time they spend reading the messages. The results of this study are based on specific self-reported characteristics of the visitors and are not directly relevant to this study. However, very important lessons can be learned from what is implied by the assumptions of this study. Educational materials need to be attractive if wilderness visitors are going to take the time to even consider them. This is true for any materials, those found on a website, brochures given out at the entrance gate or information on a trailhead sign. Once a wilderness visitor has decided to look at a message he or she will then decide if it is relevant to him or her. If it is relevant, then the

chances of the wilderness visitor's behaviour being impacted by the educational material are increased. These are the first two steps in the process of developing educational materials.

As equally important is what type of message the wilderness visitor receives. Studies have shown that the type of message communicated in educational materials can have a significant impact on whether or not the desired change in behaviour is achieved (Cialdini, 1996). This has important implications for the development of the proposed information and education management framework if managers are going to be effective in changing visitor behaviour through education. The main lesson to be learned from these studies is how the proposed information and education management framework in South Africa can avoid the common mistakes of past environmental education programs. Cialdini (1996 p1) states "communicators often try to reduce undesirable behaviour in an audience by warning that the behaviour is alarmingly prevalent." The danger in this is that it might lead to an increase of the undesirable behaviour rather than a decrease or replacement with a more desirable one because it places descriptive norms in competition with injunctive norms.

Descriptive norms are beliefs based on the perceptions of what is typically accepted or done in society, whereas injunctive norms are beliefs based on what is perceived to be socially approved or disapproved of. Essentially, beliefs of what everyone is doing versus what should be done or not done. This can be dangerous because the norms may be in conflict and it has long been believed in the field of social science that both are motivators of behaviour (Cialdini, 1996). An example of such a message could be a trailhead sign stating, "the use of illegal fires in a wilderness area is very prevalent. These illegal fires harm the environment and should be stopped." In such a message the visitor would have to choose between following the negative descriptive norm or the injunctive norm. Research (Cialdini, 1996) has shown that this type of message may actually lead to an increase in the undesired behaviour. If wilderness managers are going to be effective in using education for visitor management, careful consideration should be given to the type of message being communicated.

Chapter 4

A Proposed Management Framework for Wilderness Information Systems for Education

The use of education as a management tool in wilderness areas is not new. However, an investigation of the literature suggests that currently there is no standardized formal structure for wilderness information and education systems as a whole. Personal experience and input from key informants also supports these findings. For example, in many wilderness areas in the United States a Wilderness Education System (WES) is in place. While this may sound structured it does not necessarily imply any level of breadth or depth of the system as a whole. While it implies that whatever wilderness education techniques are used, are done so in a systematic way, it does not imply that the system itself is complete and inclusive of all the elements of an effective wilderness education program. A WES could be anything from one brochure to a fully developed education management plan including goals and objectives for a wide range of educational techniques and contact points. If managed systematically, both could be considered successful WES programs, and yet the first may be missing significant opportunities to improve their visitor management strategies. This clearly illustrates the danger in not providing a structured approach at the system-wide level. Such a system-wide approach could be a potentially powerful tool to guide wilderness managers in the planning, development, monitoring and improvement of their application of wilderness education as a visitor management technique.

It is the intention of this study to propose an information and education management framework that is focused on a system-wide approach to wilderness information and education programs. The proposed management framework is hereafter referred to as Wilderness Information Systems for Education or WISE. The literature, key informants and personal experience have informed its development. The following sections discuss the definitions, rationale and implications of the proposed WISE management framework.

4.1 Conceptual Framework of Proposed WISE Management Framework

As the proposed conceptual framework is fairly complex it is best to examine it in two phases. The first phase is primarily focused on defining the four unique stages of WISE, while the second phase is a more in-depth examination of the wilderness visitor’s educational experience within those four stages.

There are four stages of a wilderness visitor’s education experience that can be differentiated as significantly unique phases in WISE. These stages consist of points during a wilderness visitor’s experience that they could come into contact with educational material produced by the managing conservation agency aimed at influencing their behaviour. The proposed four stages are: planning, pre-trip, trip and post-trip. Figure 4.1 illustrates the cyclical relationship between the four stages and gives examples of the elements used to define and differentiate between them. This is followed by a discussion of the rationale for each stage.

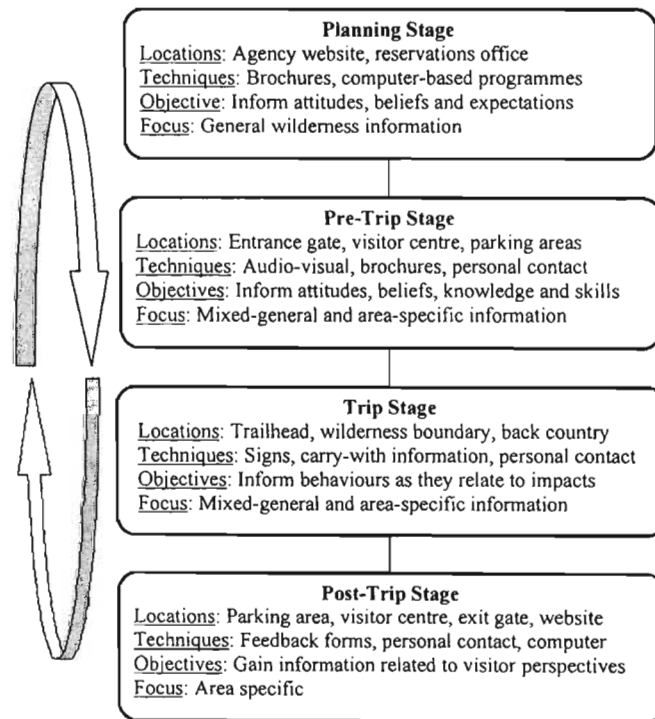


Figure 4.1 Proposed framework and example characteristics of the four stages of WISE

4.1.1 Rationale for Wise Stages

As mentioned previously, these stages have been identified on the basis of four factors related to different phases in a wilderness visitor education experience. These four factors are: location of information, selection of most likely educational techniques, determination of objective for use of education as a visitor management tool and determination of the most likely intended focus of the content of educational materials. A more detailed discussion of the role played by these factors in each of the four stages will provide a strong foundation for the second phase of the conceptual framework for the proposed WISE management framework. As previously mentioned, this proposed conceptual framework is focused only on information and education under the control of the managing agency for on-site visitor management purposes. Thus, the resulting discussion does not pertain to guidebooks, concessionaires, private or commercial education elements.

Planning Stage

Location plays a very unique role in the planning stage, as it is the time when a wilderness visitor is most removed from an environment influenced by the managing agency. In other words, in this stage the audience has the most freedom to use or ignore information from the largest variety of sources. There is more freedom than any other stage for a wilderness visitor to choose whether or not they will seek out, pay attention to and internalise wilderness education provided by the managing agency. In addition, it is the only stage in the proposed WISE framework where a wilderness visitor could go through the entire planning stage without ever encountering agency information. What the literature also indicates that this early stage is also the most important step in the process of influencing attitudes and beliefs, which are the foundation for behaviours. Thus, supporting the importance of carefully developed and managed information during the planning stage.

Due to the extreme freedom that wilderness visitors have at this stage particular education techniques are more likely. The first is the use of the agency website. This is a particularly powerful tool as it is a source that is only accessed if a wilderness visitor

initiates the process and enters the website. As previously mentioned, wilderness visitors who seek information are of particular interest to managers as they are one of the most easily influenced user groups because they are actively looking to inform their attitudes, beliefs and levels of knowledge and skill. Other techniques to be utilized during this stage include brochures, maps and agency desk staff. Again, these are sources of information that are only accessed if the wilderness visitor seeks them out at such locations as the reservation office or information phone lines. This also illustrates the importance of developing well thought out and designed education materials.

During the planning stage the most appropriate objective for the use of education as a management technique to inform wilderness visitors attitudes, beliefs and expectations. This is directly related to the models of behaviour modification previously discussed and the preventative nature of indirect management techniques, such as education.

Due to the very broad nature of information provided for the planning stage the most likely intended focus of the education materials is a general wilderness approach. During the planning stage it is not as important to provide area-specific wilderness information. At this point that level of information is generally not what a non-captive audience is seeking, resulting in a lessening of the relevance and impact of the information.

It is also important to discuss how the planning stage is connected to the post-trip stage. As Gardner (2001, p2) explains “(p)eople are constantly interpreting new situations in terms of old ones.” This implies that the past experiences of a wilderness visitor are equally important in informing the adjustment or reinforcement of their attitudes, beliefs and expectations that will influence their future behaviours in wilderness. This connection between the planning and post-trip stage is discussed further later in this section.

Pre-Trip Stage

The locations of educational materials during the pre-trip stage are significantly different from the previous planning stage. These locations include the entrance gate, visitor

centre/reception offices and parking areas. During this stage a wilderness visitor comes into an area with a much higher level of agency influence. The element of a non-captive audience still exists, but at a reduced level. For instance, a wilderness visitor now can be given information as they pass through the entrance gate. Whether or not they read and internalise the information is still questionable but it is valuable to note that all wilderness visitors receive the information, not only those actively seeking it. The same can be said for the other locations of the visitor centre/reception office and parking area. The risk of whether or not the wilderness visitor has received the information is significantly reduced.

Due to the increased level of agency influence over the educational setting, certain education techniques should be utilized more. For example, as indicated by the literature brochures and signs are perceived by wilderness managers as effective and could be used at the entrance gate and parking area. Audio-visual displays and personal contact become valuable education techniques for those wilderness visitors who chose to make contact with visitor centres and reception offices. This is highly likely in the UDP, as overnight visitors are asked to register in the mountain rescue log at the reception office.

As it is still relatively early in the wilderness education experience, the objectives of educational materials should still include some information informing attitudes, beliefs and expectations. However, it is also likely and important to include information related to knowledge and skills since wilderness visitors will move from the decision stages of behaviour models into the action stages in the next stage of WISE.

As a transition stage between the formation and action stages of the behaviour models, the focus of educational materials are most likely to be of a mixed nature. More specifically, materials discuss both general and area specific wilderness issues. For example, in the Monk's Cowl area it is possible to access two different wilderness areas from a single location. The need to inform wilderness visitors of general wilderness information is still important but it might also be necessary to inform them of issues specific to each of the areas.

Trip Stage

The education locations for the trip stage are unique in that they are used during the action stage of the behaviour models. Essentially these locations are the field portion of the wilderness recreation experience. These locations are also strongly influenced by the need for managers to maintain high levels of freedom and minimal evidence of the influence of humans. This has significant implications for the number and placement of signs or use of them at all within the wilderness area. Once again, the influence of the managing agency over the wilderness education experience is reduced and the level of freedom of the wilderness visitor is at a high level.

As a result, unique considerations must be made for the educational techniques used during the trip stage. These unique educational techniques include trailhead signs, personal contact with field staff, maps and portable information such as pamphlets on minimum impact behaviours. These are all techniques unique to the trip stage.

Since the trip stage is essentially the action step of the behaviour models previously discussed, the objectives of the use of education need to be mixed, both general and area specific. This is due to the fact that management are most likely to attempt to inform visitor behaviour to comply with both general wilderness practices, such as minimum impact behaviour, and area specific issues, such as specific area closures to camping.

Post-Trip Stage

Once again the wilderness visitor moves into a stage of the wilderness education experience where there is a high level of agency influence. However, the locations for the post-trip stage are unique in that they are locations present during the planning and pre-trip stage, but serve a different function. These locations now seek to receive feedback and provide reinforcement of positive wilderness behaviours. These locations include parking areas, visitor centres/reception offices, exit gates and agency website. Once again there is an increased likelihood that wilderness visitors will encounter more than one of these locations because overnight wilderness visitors must sign out in the mountain rescue registry upon completion of their trip.

The educational techniques used in the post-trip stage should be specific for the purpose at hand as they fulfil a role that is not intended in any of the other stages of WISE. For these reasons, educational techniques such as feedback forms are most likely. For example, when wilderness visitors go to the reception office to sign out in the mountain rescue registry, they could be presented with a feedback form. This information could then be used to develop an understanding of two issues. The first issue is wilderness visitor information such as perceptions and demography. The second issue is area specific information for visitor impacts on environmental conditions such as; reported trail damage, reported levels of litter and perceptions.

As has already been implied, the objective of the post-trip stage is unique in that it seeks to gain information related to visitor perceptions and behaviour. This serves two functions. The first function is to provide wilderness managers with visitor information that can feed back into the planning and development process of educational materials. The second function is that visitor feedback can serve as a positive reinforcer for appropriate wilderness behaviour, and can increase the level of ownership that wilderness visitors have for the resource and experience.

Clearly, in the post-trip stage, educational techniques are more likely to be area-specific. This is largely due to the fact that feedback will be directly related to the experience of an individual in a particular wilderness area, not in wilderness areas in general.

Lastly, it is important to discuss how the post-trip stage feeds back into the planning-stage. As was previously mentioned, and is illustrated in Figure 4.1, new experiences are partially founded on past experiences. This demonstrates the importance of providing positive reinforcement for appropriate wilderness behaviour and ownership of the resource and experiences. These clearly can have significant impacts on future behaviour in wilderness areas as they are carried over into the planning-stage of the next wilderness education experience.

The first phase of discussion about the conceptual framework gives a clear illustration of how information and education systems can be viewed from a management perspective. However, as Ham and Krumpal (1996 p17) explain:

“Resource managers often make the mistake of designing messages that contain only important factual information concerning the behaviour they desire people to change. What they fail to do is consult the intended recipients of the message (for example, the visitors to a protected area or the local inhabitants) to identify which of their beliefs really influence how they behave in the particular situation.”

This is why it is critical to include the second phase of discussion about the conceptual framework of the proposed WISE management framework.

The second or more in-depth phase of the discussion about the conceptual framework, is intended to illustrate the interaction of the four stages of WISE and the wilderness visitor experience. This brings the wilderness visitor’s perspective into the WISE framework. There are three valuable lessons that can be learned from a structured approach to understanding the interaction between the four stages of WISE and the wilderness visitor experience.

Firstly, by illustrating the options available to wilderness visitors as they move through a wilderness experience, the effects of information and education on the decision-making process become explicit. Individuals can choose not to embark on a wilderness trip at various points. This can be highly influenced by how wilderness managers influence attitudes, beliefs and expectations during the planning and pre-trip stages. This alone may help to prevent a certain amount of visitor behaviour in the wilderness area that is not consistent with the management goals and objectives. The second phase of discussion also illustrates that while a wilderness visitor is a non-captive audience their actions have a direct impact on the wilderness resources and experience. This is particularly poignant in the trip-stage where there is no option to abort the trip any longer as it has already begun. Whether the trip portion of the experience is longer or shorter than intended it is a

trip. Consequently, whether informed or uninformed, visitor behaviours will impact on the resource and experience. Thus, wilderness management needs to be proactive in order to manage education and information in an effective manner.

In addition, the second phase of discussion illustrates how contact with information and education can influence behaviour, which was only implied, but not made explicit in the first phase of discussion. The benefit of this is that it helps to keep the application of the other elements of WISE, the criteria, criteria evaluation form and information and education development guidelines, within a structure. For example, wilderness information on the website is aimed primarily at the planning stage. At this early stage in the process, it might be useful to not only explain what are appropriate attitudes, beliefs and expectations for wilderness, but also what would be appropriate attitudes, beliefs and expectations for other types of designated areas. This would allow visitors to decide, at an appropriate stage, that their intended behaviours such as a camp with a group of 18 people accompanied by large fires are not compatible with established wilderness use limits such as, a maximum number of people allowed to camp in cave is 12 and open fires illegal, and chose perhaps to go to a nature or game reserve. Otherwise, this group might start the trip stage before they learn this information and go ahead with their intended behaviours anyhow in a wilderness area.

The third lesson that can be learned from the second phase of discussion is that there are certain limitations to what education can do for each of the four stages of WISE. For instance, once a wilderness visitor is in the trip stage, there is very little that can be done to influence attitudes, beliefs and expectations that ultimately result in behaviours. Consequently, these issues should be addressed prior to the trip-stage. A proposed framework incorporating both phases of the discussion of the WISE management framework is illustrated in Figure 4.2.

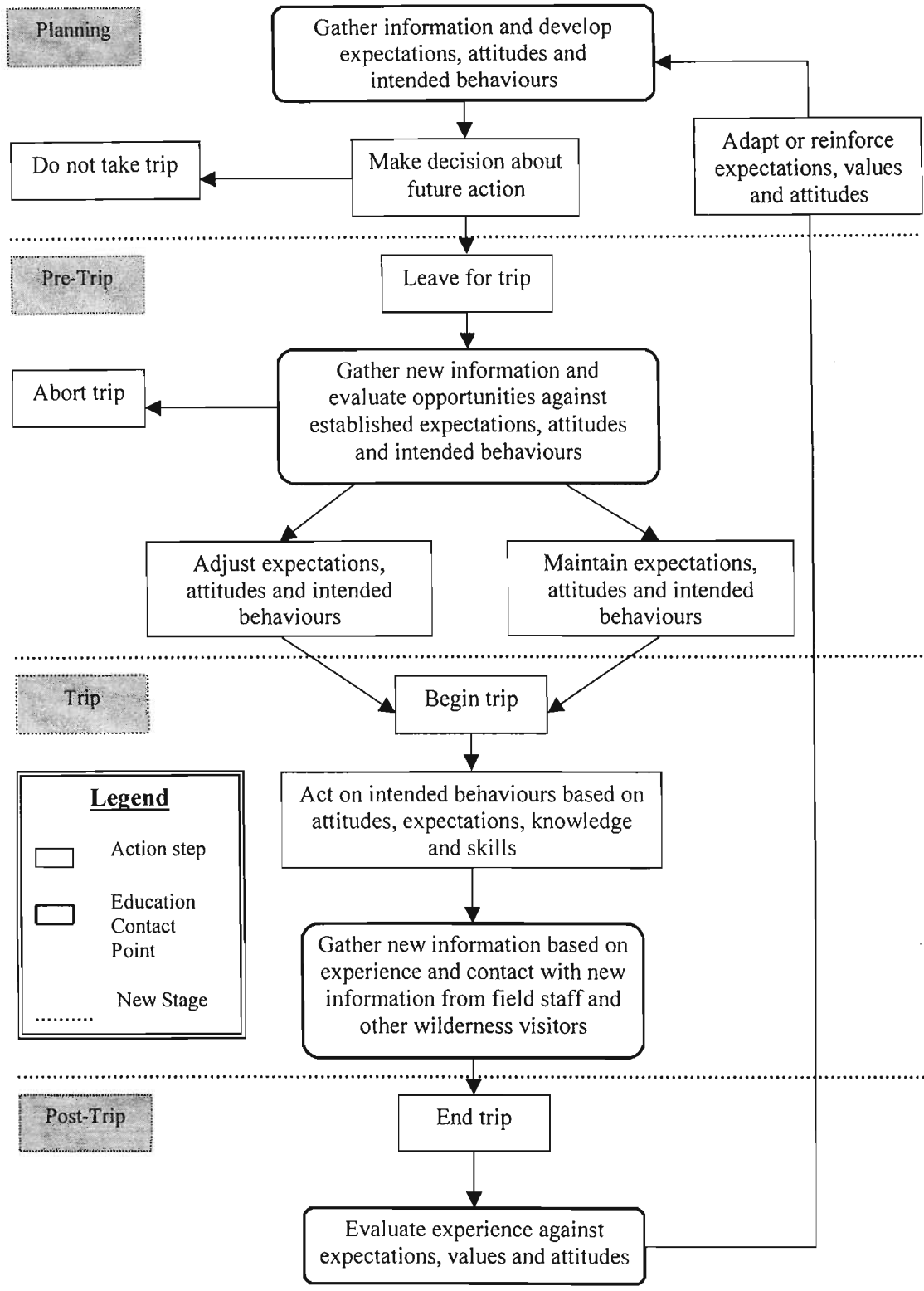


Figure 4.2 Proposed framework for WISE recreation experience

With a structured framework that includes both the management and visitor perspectives a system-wide approach can be taken to managing wilderness information and education techniques. This proposed framework now becomes an invaluable tool to guide the development of the WISE criteria used to evaluate the information and education system.

4.3 Establishing Criteria

It is an intended objective of this study to develop a set of WISE criteria as part of the proposed management framework that can be used as an effective inventory and measurement tool. By using these criteria, wilderness managers will be able establish three points of information essential for effective management. The first point is an initial inventory of what education materials exist within the wilderness information and education system, as well as what the current levels are. There must be an understanding of “what” is present before the questions of “how to manage it” and “how to improve it” can even be asked. Secondly, managers are able to set management objectives based on these criteria. This is discussed in greater detail in section 4.4. Lastly, managers are able to monitor their progress in meeting those management objectives by monitoring the results of the evaluation form over time.

4.3.1 Selected Criteria

The development of a set of WISE criteria was informed by the literature, input from key informants and personal experience, as well as the proposed WISE framework. Within all this information many, elements could be considered as criteria. However, it is important to keep the set of criteria at a manageable level in order to increase the applicability. In order to synthesize all the possible options into a manageable, practical and useful set of criteria, selection was based on three priorities in descending order. The first priority was for elements that are present both in the literature and the UDPWMP. This was given first priority because it clearly illustrates recognition of the vital nature these elements for effective wilderness management, at both the international and provincial level. Criteria that qualified under this condition represent 50% of the total number selected. Second priority was given to elements that were represented either in the literature or draft wilderness management plan for the UDP. This was used as a priority because it helps to capture both elements seen as important on an international

level, and those at a provincial level, thus helping to fit the criteria into a South African context. Criteria that qualified under this condition consist of 33% of the total number of criteria. Lastly, a few elements were included as they play a unique role in the proposed WISE framework and are important points of education contact. Criteria that qualified under this condition consist of 17% of the total number of criteria. Table 4.1 illustrates the criteria for each of the four stages of WISE, and indicates how they qualified in the prioritisation process.

Table 4.1 Selected criteria and priority marking

Criteria		<i>UDP/WMP</i>	<i>Literature</i>
Planning Stage	1. Percentage of wilderness-related information on agency website related to either knowledge, skills, attitudes or behaviours.		X
	2. Percentage of wilderness related information in printed form at the agency reservations office, related to either knowledge, skills, attitudes or behaviour.	X	X
	3. Percentage of wilderness related information in visual media form at the agency reservations office related to either knowledge, skills, attitudes or behaviour.	X	X
Pre-Trip Stage	1. Percentage of wilderness related information in printed form given at the entrance gate related to either knowledge, skills, attitudes or behaviours.	X	
	2. Percentage of wilderness related information in printed form at the visitor centre related to either knowledge, skills, attitudes or behaviours.	X	X
	3. Percentage of wilderness related information in printed form in the parking area related to either knowledge, skills, attitudes or behaviours.	Unique	
Trip Stage	1. Percentage of wilderness related information in printed form given on trailhead signs related to either knowledge, skills, attitudes or behaviours.	X	X
	2. Percentage of wilderness related information in printed form in the field related to either knowledge, skills, attitudes or behaviours.	X	X
	3. Percentage of wilderness related information in verbal form received from field staff in the field related to either knowledge, skills, attitudes or behaviours.	X	X
Post-Trip Stage	1. Percentage of wilderness related information in printed form in the parking area related to visitor feedback on either knowledge, skills, attitudes or behaviours.	Unique	
	2. Percentage of wilderness related information in printed form in the visitor centre related to visitor feedback on either knowledge, skills, attitudes or behaviours.		X
	3. Percentage of wilderness related information on agency website related to visitor feedback on either knowledge, skills, attitudes or behaviours.		X

4.3.2 Rationale for Criteria Selection

This section is primarily focused on providing specific rationale for each criterion. Firstly, a rationale is given for the general or common elements of each of the criteria and then discussion is provided specifically for each.

There are two general or common elements to be discussed. The first is that of the number of criteria allotted for each stage. If an inventory form is to be practical and useful it must be clear and easy to use in a short amount of time. If it is not, then the likelihood of getting complete or accurate information is lessened. As a result, three criteria were allotted to each of the stages as it was felt that this would be enough to cover a range of elements within each stage yet still meet the qualities of clarity and ease. The second general or common element is that every criterion includes in its assessment the presence of information related to knowledge, skills, attitudes or behaviour. This brings up the question of exclusive categories or making the category so broad that no useful information could be gained. The rationale behind including all the elements is two-fold. The first reason is that these criteria will be used with an inventory form in an area where monitoring and inventorying of education materials is in its infancy stage. Consequently, at this stage it is important to simply determine whether any of these types of information are present. Later on in the monitoring process, as the WISE program matures, the criteria should be adjusted to be more specific to meet management goals and objectives. The second reason for including all four categories is that as it is a preliminary study, it will be useful to test the ease of discerning between these types of categories and others such as factual information.

The following is a discussion of the rationale for each criterion specifically.

Criterion 1: Planning Stage

The use of computers and Internet are known to be a valuable source of information for visitors to wilderness areas (Burgess, 2000). This affords an opportunity for the managing agency, EKZN in the case of this study, to start to influence visitor behaviour early in the stages of the visitor education experience. As a result, it is felt the agency website should be part of the focus of management's monitoring and evaluation efforts.

Criteria 2 & 3: Planning Stage

The reservations office is a valuable point of contact for the managing agency during the planning stage where a wide variety of types and forms of educational techniques can be used. Examples include pamphlets, personal contact and audiovisual displays. For this reason they were included in the three criteria for the planning stage.

Criteria 1, 2 & 3: Pre-Trip Stage

Particularly in the South African and the UDP context, there are three main points at which a visitor can come into contact with education techniques during the pre-trip stage. For this reason, all three locations of the entrance gate, visitor centre/reception office and parking area were included. The printed form of information was targeted, as it is the most feasible for these areas.

Criterion 1: Trip Stage

Trailheads are seen as a powerful and useful management tool in wilderness areas (McCool & Cole, 2000) and have been identified by the management in the UDP as valuable (Kruger, 2003). For these reasons trailhead signs have been included as part of the focus of management monitoring and evaluating programmes.

Criterion 2: Trip Stage

This criterion is included because it is felt that it may be important to monitor the signage for such things as trail closures, rehabilitation areas, prohibited uses such as fires in caves and other management concerns. This baseline information could possibly be used in future studies to compare the effectiveness of various management practices to influence visitor impacts on some of these issues.

Criterion 3: Trip Stage

Personal contact has been identified as a meaningful point of educational contact (Manning & Lime, 2000) and yet the effectiveness of which is difficult to determine. For this reason it has been identified as one of the valuable areas for management to focus on in their monitoring efforts.

Criteria 1 & 2: Post-Trip Stage

The post-trip stage is very similar to the pre-trip stage in that there are two main opportunities for contact with educational techniques controlled by the managing agency. For this reason the parking area and visitor centre/reception area have been selected as focal points for management to monitor.

Criterion 3: Post-Trip Stage

Since the agency website is already established as a location where wilderness visitors can actively find and inquire about information it was determined that it would be a good location to consider as an opportunity for feedback. It also makes explicit the link between the post-trip stage and the planning stage.

4.4 WISE Criteria Evaluation Form

In order to operationalize the set of WISE criteria an evaluation form was developed. It is intended that this evaluation form will be used as an inventory and monitoring tool. An example from the developed criteria evaluation form is provided in Figure 4.3. This is followed by a discussion of the rationale and intended use of each element on the form.

1. Percentage of wilderness related information on agency website related to either knowledge, skills, attitudes or behaviours.	High	Med	Low	Very Low	None
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	★1 ↑	★2 ↗	★3 ↘		★4 ↙
Number of individual information sources	1	2	3	4	5+
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments	<hr/> <hr/> <hr/> <hr/>				

Figure 4.3 Elements on evaluation form

★ # = Element to be explained below
High = High percentage rating
Med = Medium percentage rating

KEY
Low = Low percentage rating
Very Low = Very Low percentage rating
None = No materials present

Element 1 is the criterion that is to be evaluated. In this context, it indicates a management goal. In the example, the management goal is to provide wilderness information on the agency website that is related to knowledge, skills, attitudes and behaviours. This is closely related to element 2 as will be discussed below. Element 1 also illustrates how the proposed WISE framework can be operationalized. This is accomplished through the creation of appropriate management goals (element 1) and objects (elements 2 and 3) based on a structured management framework.

Element 2 is the scale of scores to be used. The definition of these scores is as follows: High= 100%-76%, Med= 75%-51%, Low= 50%-26%, Very Low= 25%-1%, None= No wilderness information present. This scale was chosen for three reasons. The first is that it quickly identifies if there is any wilderness information present at all, which should be the first question asked. The second reason is that as an inventory tool it must be quick and easy for an administrator to understand and use. Hence, basic percentages are used because they are simple and quick to calculate. The third is that the categories provide enough range and variation to be useful as a management tool and measurement of progress of meeting management objectives. To continue with the example form above, in the context of the evaluation form, this element represents the objective of the management goal in element 1. In the example the identified management goal is to provide wilderness information on the agency website related to knowledge, skills, attitudes and behaviours. However, an objective of “Med” occurrence for instance would be set as the desired level. This information can then be incorporated into the monitoring plan. Each time an inventory of WISE is done a manager will know if the objective is being met, or if not whether there is too much or too little of the appropriate type of information.

Element 3 is used to create a context for element 2. It is important for managers to be aware of the number of overall sources in order to create a context for the percentage rating. For example, a score of “Med” could mean one pamphlet out of two or nine out of 20. The difference between the two cases could have very important implications for management.

Element 4 is provided to include any other important information the evaluator may feel is useful to record. This is useful in keeping consistency between individuals administering the evaluation and managers using the information. For example, one

of the criteria evaluates wilderness information gained from staff in the field. With only elements 1 thru 3 there could be confusion as to what the various ratings indicate. Element 4 can provide an explanation such as “ranger only talked about weather” thus resulting in a very low percentage rating and one source. In contrast, element 4 could state “ranger discussed reasons and impacts to wilderness experience as a consequence of the illegal fires in the caves and weather” resulting in a medium percentage rating and two sources. Element 4 adds valuable clarity and consistency to the administration and recording of data from the evaluations forms.

An example of the evaluation form in its entirety can be found in Appendix E.

4.5 WISE Guidelines

The previous sections of this chapter have looked at the proposed WISE frameworks, criteria and criteria evaluation form. While collectively these elements are powerful management tools, individually they are incomplete. The literature identifies the effectiveness of educational techniques as a critical component of any education program. As has already been discussed, the proposed WISE framework, criteria and criteria evaluation form are focused at the overall system level. They do not necessarily address the effectiveness of materials and messages used in the system. It is not the intent of this study to investigate this component of the various educational techniques of WISE. However, WISE in South Africa would be incomplete as a wilderness management framework if it did not provide some base guidelines to be used in the development of effective educational techniques. Thus, it is the intention of this study to provide a set of guidelines that can be used in development and possible future evaluation of information and education materials used within the WISE in South Africa management framework. These guidelines have been synthesized from two sources. The first source is the broad theoretical areas of influence that informed this study. The second source is a paper written by Manning and Lime (2000). Manning and Lime did a meta-analysis of nine studies in order to establish a set of guidelines for information and educational techniques. The nine studies focused on evaluations of the use of information and education in a wide range of situations, for a range of target audiences, media and issues. From their analysis eleven guidelines were established for the development and use of information and education in wilderness management. This, in addition to information synthesized from the literature has informed the development of a set of fifteen guidelines to

provide support in the development of WISE educational techniques. These guidelines are described in Table 4.2.

Table 4.2 WISE guidelines for the development of information and educational techniques (*adapted from Manning & Lime, 2000*)

Wise Guidelines

1. Use of multiple media to deliver a messages is often more effective than the use of a single medium.
2. Information and education programs are generally more effective with visitors who are less experienced and less knowledgeable. Young visitors may be an especially attractive target audience.
3. Brochures, personal messages and audio-visual programs may be more effective than signs.
4. Messages may be more effective when delivered early in the recreations experience, such as during the planning stage.
5. Messages from sources judged as highly credible may be most effective.
6. Computer-based information systems (internet, visitor information computer in visitor centre, *etc.*) can be an effective means of delivering information and education.
7. Knowledgeable volunteers, outfitters and commercial guides can be effective and efficient in communicating information and education to visitors.
8. Information on the impacts, costs and consequences of problem behaviour can be an effective information and education strategy.
9. Role modelling by park and wilderness rangers and volunteers can be an effective information and education strategy.
10. Personal contact with visitors by rangers and other employees, including before, during, and after the recreation experience, effectively communicates information and education.
11. Messages should be targeted or relevant to specific audiences to the extent possible. Target audiences that might be especially effective include those that request information in advance (internet, reservation office, *etc.*) and those who are least knowledgeable.
12. Information and education materials that are attractive are more likely to be noticed and to be effective.
13. Information and education related to knowledge, skills and attitudes is more likely to impact visitor behaviour than information which is not.
14. Information and education techniques that illustrate or demonstrate visitor ownership of wilderness resources and values can be more effective than those that do not.
15. Feedback from visitors can be a valuable tool to develop, refine and improve information and education techniques.

Chapter 5 **Methodology**

The methodological framework of evaluation research, more specifically formative as opposed to summative evaluative research, has guided this study. It is important to note the distinction between summative and formative evaluation research as it has implications for the development of appropriate expectations for this study. Summative evaluation research is focused on effects of a specific intervention, such as whether WISE influences wilderness visitors at a high or low level (Monette, Sullivan, DeJong, 1990). Summative research can be an extremely valuable tool when looking at programs such as WISE. However, as WISE is the initial stages of development, a structured approach must first be developed, prior to evaluation of the program itself. As a result, the present study should be considered formative in nature, based on two factors. Firstly, this study is being undertaken in an attempt to help guide and improve the processes of managing information and education programmes for wilderness areas in the UDP. In fact, the focus on the process of developing and refining management frameworks, inventory and monitoring tools is at the very heart of this study. The second factor supporting the classification of this study as formative evaluation research, is that the results of the study should have almost immediate practical implications for the managers of the area. This strong focus toward applied research is characteristic of formative evaluation research (Monette *et al.*, 1990).

5.1 Sampling

5.1.1 Sample Selection & Characteristics

The population for this study is defined as the UDP. From this population a case study site was selected using purposive sampling techniques. This technique is used due largely to the constraints on the study. Given limited time and funding, it is important that time and energy be focused on samples that will provide the most comprehensive understanding of the subject (Babbie, 1995). Thus, the criterion for this purposive sampling is based on issues of site priority from the point of view of the managing agency, access to site, access to information, cooperation from agency staff in the area and other logistical considerations (accommodation, travel expenses, *etc*).

It is important to discuss the reason for selecting a case study approach for this study. As Babbie (1990, p300) explains “(a)lthough other methods may be challenged as ‘superficial’, that charge is seldom lodged against field research.” It is important that the limited amount of information to be gathered from the direct observation have optimal impact on the refinement of the proposed WISE framework, criteria and guidelines. However, it is also recognized that there are some challenges to using a case study approach. The main challenge being the reliability of the study may be questioned due to its subjectivity and repeatability. Since it is the process rather than the raw data that is the focus of this study this challenge should be easily overcome. In addition, issues of reliability will be addressed by making explicit the processes behind the development and application of the various elements of WISE.

The reason for the selection of the entire Mlambonja Wilderness as the case study site was based on three criteria. The first is that it is located in the UDP. This is important because of its easy accessibility from the point of view of direct observation within the studies identified population. The second criterion is that it is a relatively small wilderness area in comparison to others within the UDP and will thus have fewer variables to consider (multiple entrance points, shared entrance points with other wilderness areas, *etc*). The third criterion is that the Mlambonja Wilderness Area in the Cathedral Peak area enjoys a high profile and is recognised as a significant destination in the UDP. The number of visitors per year is not among the highest in the UDP, thus implying that the area is currently at relatively low levels of impact. Consequently, it is important to make the area a priority for proper management given the anticipated increase in visitation. So while the results of this study may not be applicable to all wilderness areas in South Africa, it is likely they will serve as a good indicator for the UDP.

5.1.2 Sample Size

A single case study site is selected for two reasons. The first is that as the primary function of this study is to serve as a formative development of the proposed WISE management framework, it is important to keep the focus of the study very narrow. The case study site will be used in order to refine the elements and test the processes involved in the proposed educational management framework, not produce or examine raw data. As a result, this researcher feels that the use of two or more case

study sites would shift the focus from formative evaluation to more of a comparative approach, thus distracting from the aims and objectives of the study.

5.2 Procedure

Practical arrangements for the purposes of direct observation are to primarily be made through EKZN Wildlife with Sonja Krueger as the contact person. Sonja Krueger is the Regional Ecologist in charge of the UDP, which contains the case study site. There was also the possibility of gaining access to visitor information, management plans and accommodation during the direct observation.

5.3 Methods of Observation / Data Collection

5.3.1 Literature Review

This step in the methodology receives a high level of emphasis in this study, as the main objectives of the study are to develop a proposed wilderness information and education management framework. The product of this step in the methodology process constitutes Chapter 3. During this process information from the three influencing theoretical areas, input from key informants and personal experience was compiled and reviewed. More specifically, it was necessary to determine the roles played by wilderness management; environmental education and interpretation and behaviour modification in contributing to the development of a structured process for developing, planning and evaluating of WISE in the UDP. This included relevant information obtained from the international and national bodies of literature. The synthesis of this information informed the development of the proposed WISE management framework found in Chapter 4. This framework was then be used in conjunction with relevant literature to develop the set of WISE criteria. These criteria reflect research and experiences in other areas of the world, as it can be adapted to a South African context. The other elements of this study that have developed primarily from the literature review are the criteria evaluation form and information and education development guidelines. This method of data collection is intended to improve the reliability in two ways. In this study, bias will be addressed by explicitly identifying the values, assumptions and theories that support this research. Bias cannot be eliminated, but if addressed properly its influence can become transparent. The use of triangulation of theory in the literature review will also aid in the improvement of the validity of the study.

5.3.2 Pre-Site Visit

The pre-site visit will be accomplished by examining the four stages of WISE. This includes visits to the following:

- The reservations office of EKZN Wildlife;
- The Cathedral Peak entrance gate;
- The Cathedral Peak visitor centre;
- An overnight trip into Xeni cave in the Mlambonja Wilderness Area;
- The Cathedral Peak visitor centre on our way out before passing through the exit gate.

This will be done in order to accomplish three goals. The first goal is to inspect the site in order to ascertain which important considerations inform the development of the WISE framework and criteria. This will help to eliminate the possibility that the field research will be compromised due to unexpected conditions in the field which may have been overlooked, and to improve the initial proposal of the various elements of WISE. The second goal is to familiarize the field staff at the study site area with the study before commencing with the field research component. This will assist in eliminating any unnecessary conflicts during the field research component due to confusion or misunderstandings. The third goal is to make sure that all logistical aspects of the fieldwork are understood and are realistic, prior to the commitment of large amounts of time and energy.

5.3.3 Direct Observation

This method involves going directly to the case study site, inclusive of the four stages of WISE, and testing the proposed framework, criteria and the design of the criteria evaluation form. This will be accomplished with the use of multiple administrators of the evaluation form for the case study site. The difficulties and successes encountered during this process will be documented and used in the last step of the methodology discussed in section 5.5.

5.4 Methods of Data Collection / Synthesis And Analysis

This step in the methodology is primarily intended to analyse the processes of application of the proposed WISE framework, criteria and criteria evaluation form in the field. The results from this analysis will then be used to refine and improve the

WISE framework, criteria and criteria evaluation form. The aim of this study is to ensure that the system may be instated and inform wilderness managers of the UDP immediately upon completion of this study.

5.5 Application of Results

This step in the methodology is intended to produce four products. The first of the products are the revised versions of the proposed WISE framework, namely criteria and criteria evaluation form based on the results of field-testing. The fourth product is a user manual including the four elements of WISE, namely the revised versions of the proposed framework, criteria, criteria evaluation form and the information and education materials development guidelines. The user manual will also include the general background of WISE, detailed instructions for administering the criteria evaluation form and a feedback form for administrators of the form. It is intended that the inclusion of the feedback form will ensure that WISE undergoes constant improvement and refinement in the process of becoming an effective wilderness management tool.

5.6 Methodology Process Diagram

The following diagram illustrates what methods will be utilized during this study. The diagram also illustrates the chronological order in which they are intended to happen in relation to each other and the associated objective for each step in the process (Figure 5.1).

5.7 Overview of Component A

The aim for Component A of this study is to accomplish three goals. The first goal is to establish the context and rationale for this study, thus illustrating the vast importance and support for the development and proposal of a wilderness information and education management framework that functions on a system-wide level specific to South Africa. The second goal of component A is to discuss the relevant information from the theoretical areas of behaviour modification, wilderness management and environmental and interpretation theory. This information, along with input from key informants and personal experience, will serve as the foundation for component A to enable it to accomplish its third goal. The third goal is to propose a new wilderness information and education management framework that can be used

by managing agencies to inventory, monitor and improve the entire information and education system in their areas. The other elements of the study such as the results from the field-testing, the refined WISE management framework and recommendations will be discussed in component B.

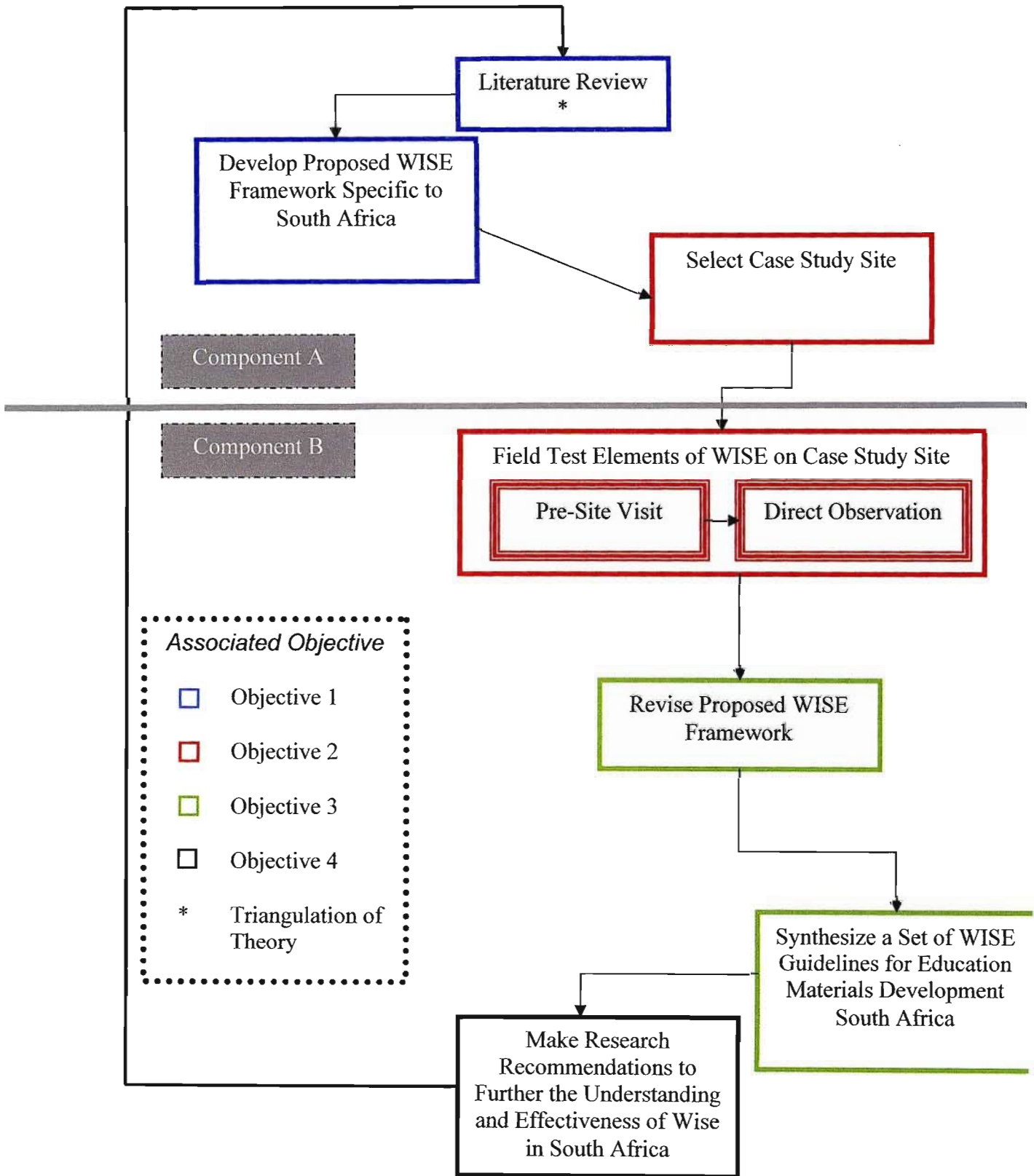


Figure 5.1 Methodology process diagram

References

Babbie, E. 1995. *The Practice of Social Research*. Seventh ed. Wadsworth Publishing Co. Belmont, California, USA.

Bainbridge, W. R. 2001 (a). Mountain Wilderness in South Africa. *International Journal of Wilderness*. Vol 7(2): 30-34.

Bainbridge, W. R. 2001 (b). An Update on Wilderness Conservation in the New South Africa. *International Journal of Wilderness*. Vol 7(3): 38-42.

Bandura, A. 1969. *Principles of Behavior Modification*. Holt, Rinehart and Winston, Inc. USA.

Bandura, A. 1986. *Social Foundations of Thought and Action*. Prentice-Hall, Inc. Englewood Cliffs, New Jersey, USA.

Brown, K, M. 1998. Social Cognitive Theory Overview. Publication of the University of South Florida, USA. Sourced at hsc.usf.edu/~knbrown/Social_Cognitive_Theory_Overview.htm on 24/01/03

Buckley, R. 2000. Wilderness in Australia: What's Happening in a World Context. *IN: Proceedings of the Wilderness Science In A Time Of Change Conference*. Missoula, Montana. May 23-27. 1999. USDA Forest Service Proceedings. Vol. 2 p190-193.

Burgess, C. 2000. Wilderness on the Internet: Identifying Wilderness Information Domains. *IN: Proceedings of the Wilderness Science In A Time Of Change Conference*. Missoula, Montana. May 23-27. 1999. USDA Forest Service Proceedings. Vol. 4 p187-192.

Callicott, J.B; Nelson, M.P. 1998. *The Great New Wilderness Debate*. University of Georgia Press. Athens, GA, USA.

Cessford, G.R., Dingwall, P.R., 1997. Wilderness and Recreation in New Zealand. *International Journal of Wilderness*. Vol 3(4): 39-43.

Cessford, G, R. 2000. Identifying Research Needs for Improved Management of Social Impacts in Wilderness Recreation. *IN: Proceedings of the Wilderness Science In A Time Of Change Conference*. Missoula, Montana. May 23-27. 1999. USDA Forest Service Proceedings. Vol. 3 p 231-238.

Chhabra, T. 2001. The Toda People. *International Journal of Wilderness*. Vol 7 (3): 35-37.

Cialdini, R, B. 1996. Activating and Aligning Two Kinds of Norms in Persuasive Communications. *Journal of Interpretation Research*. Vol. 1(1): 1-7

Cole, D. 1993. Wilderness Recreation Management. *Journal of Forestry*. Feb Vol. 91(2): 22-24.

Cole, D.N. McCool, S.F. 2000. Wilderness Visitors, Experiences, and Visitor Management. *IN: Proceedings of the Wilderness Science In A Time Of Change Conference*. Missoula, Montana. May 23-27. 1999. USDA Forest Service Proceedings. Vol. 4 p1-2.

Davey, A, G. 1998. *National Systems Planning for Protected Areas*. Series no.1. IUCN. Gland, Switzerland and Cambridge, UK.

Davis, J.C. 2002. Potential Impacts of DFO Budget Cuts to Salmon Conservation. A communication from John Davis as the Regional Director General for British Columbia, Canada to John A. Fraser, chairman of the Pacific Fisheries Resource Conservation Council. Sourced at www.fish.bc.ca/html/fish300A.htm on 23/01/03.

Derwent, S; Porter, R; Sandwith, T. 2001. *Maloti-Drakensberg Transfrontier Conservation and Development Programme*. Ezemvelo KwaZulu-Natal Wildlife.

Dini, J. 1999. Information provided on the website of South African Wetland Conservation Programme. Sourced at www.ngo.grida.no/soesa/nsoer/resource/wetland/natal_drak.htm

Draper, M., Watson, A. 2002. Running with the Wild Dogs: Global Wilderness Management Education in Africa. *International Journal of Wilderness*. Vol 8(1): 31-32.

Estrada, R. E., Puga, A. P. 1998 Determining Significance of Protected Areas in Cuba: Sistema Nacional De Areas Protegidas. *International Journal of Wilderness*. Vol 4(2): 13-16.

Fishbein, M. Ajzen, I. 1975. *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*. Addison-Wesely Publishing Company, Inc. Meleno Park, California, USA.

Glazewski, J. 2000. *Environmental Law In South Africa*. Butterworths Publishers (pty) Ltd. Durban, South Africa.

Gunderson, K. Barns, C, V. Hendricks, W, W. McAvory, L, H. 2000. Wilderness Education: An Update Review of the Literature and New Directions for Research and Practice. IN: *Proceedings of the Wilderness Science In A Time Of Change Conference*. Missoula, Montana. May 23-27. 1999. USDA Forest Service Proceedings. Vol. 4 p253-259.

Ham, S, H. Krumpel, E, E. 1996. Identifying Audiences and Messages for Nonformal Environmental Education: A theoretical Framework for Interpreters. *Journal of Interpretation Research*. Vol 1(1): 11-23.

Hanna, G. 1995. Wilderness-Related Environmental Outcomes of Adventure and Ecology Education Programs. *The Journal of Environmental Education*. Fall, Vol. 27(1): 21-33.

Hendee, J, C; Dawson, C, P. 2002. *Wilderness Management: Stewardship and Protection of Resources and Values*. Third Edition. Fulcrum Publishing. Golden Colorado, USA.

Hungerford, H, R; Volk, T, L. 1990. Changing Learner Behavior Through Environmental Education. *The Journal of Environmental Education*. Vol. 21(3): 8-21.

Krumpe, E, E. The role of Science in Wilderness Planning-A State-of-Knowledge Review. *IN: Proceedings of the Wilderness Science In A Time Of Change Conference*. Missoula, Montana. May 23-27. 1999. USDA Forest Service Proceedings. Vol. 4 p5-12.

MacDevette, D. R. 1990. Wilderness in South Africa. *Eastern Cape Naturalist*. Pp 22-28.

MacDevette, D.R. 1994. The Situation In Relation Environmental Information in South Africa. *ESDA Report 94/1*. Paper presented at the Program on Environmental Information Systems in Sub-Saharan Africa. Sixth Advisory Committee meeting held in Harare, Zimbabwe, April 5-9.

MacDevette, D, R. 1995. Natural Resource Management in Sub-Saharan Africa. *ESDA Report 95/1. Empowerment for African Sustainable Development*. Bo, Norway August 28-30.

Manning, R.E., Lime, D.W. 2000. Defining and Managing the Quality of Wilderness Recreation Experiences. *IN: Proceedings of the Wilderness Science In A Time Of Change Conference*. Missoula, Montana. May 23-27. 1999. USDA Forest Service Proceedings. Vol. 4 p13-52.

McCool, S, F; Cole, D, N. 2000. Communicating Minimum Impact Behavior With Trailside Bulletin Boards: Visitor Characteristics Associated with Effectiveness. *IN: Proceedings of the Wilderness Science In A Time Of Change Conference*. Missoula, Montana. May 23-27. 1999. USDA Forest Service Proceedings. Vol. 4 p208-216.

Monette, D, R; Sullivan, T.J; DeJong, C, R. 1990. *Applied Social Research: Tool for the Human Services*. Second edition. Holt, Rinehart and Winston Inc. The Dryden Press. Saunders College Publishing. USA.

Ostergen, D., Hollenhorst, S. 2000. The Russian Chronicles of Nature (Letopis prirody): Is This A Model for A Chronicle Of Wilderness. *International Journal of Wilderness*. Vol 6(1): 28-34.

Stankey, G.H. 2000. Future Trends in Society and Technology: Implications for Wilderness Research and Management. *IN: Proceedings of the Wilderness Science In A Time Of Change Conference*. Missoula, Montana. May 23-27. 1999. USDA Forest Service Proceedings. Vol. 1 p10-23.

Starzell, D. 1995. Park Closure (Was: AT Conference in Harrisonburg). An email communication to the National Scenic Trail organization from Mr. Starzell as the Executive Director of the Appalachian Trail Charity. Sourced at www.backcountry.net/arch/at/9507/msg00028.html on 23/01/03.

UDPWMP: ukhahlamba-Drakensburg Park Wilderness Management Plan. March 4th, 2003. Ezemvelo KwaZulu-Natal Wildlife. Draft version.

Ulfelder, W.H. 1998 The Community Park Ranger Program In The Cayambe-Coca Ecological Reserve: Analyzing The Effectiveness Of A Wilderness Protection Strategy In Ecuador. *International Journal of Wilderness*. Vol 4(2): 39-42.

United Nations. 1996. *World Population Prospects: the 1994 revision*. New York: United Nations Department of Economics and Social Information and Policy Analysis Division.

Watson, A, E. 2000. Wilderness Use in the Year 2000: Societal Changes That Influence Human Relationships With Wilderness. *IN: Proceedings of the Wilderness Science In A Time Of Change Conference*. Missoula, Montana. May 23-27. 1999. USDA Forest Service Proceedings. Vol. 4 p53-60.

Zelenzy, L, C. 1999. Educational Interventions that Improve Environmental Behaviors: A Meta-Analysis. *The Journal of Environmental Education*. Fall, Vol. 31(1): 5-15.

Zunino, F. 2001. The Mountainous Wildlands of Italy. *International Journal of Wilderness*. Vol 7(2): 35-39.

Personal Communications

Krueger, S. 2003. Nature Conservation Scientist. Regional Ecologist uKhahlamba. uKhahlamba Regional Office. EKZN Wildlife. P.O. Box 13053, Cascades, 3202, South Africa.

Densham, D. 2003. Coordinator for the Protected-Area Management Stream within the Centre for Environment and Development, University of Natal, Pietermaritzburg.

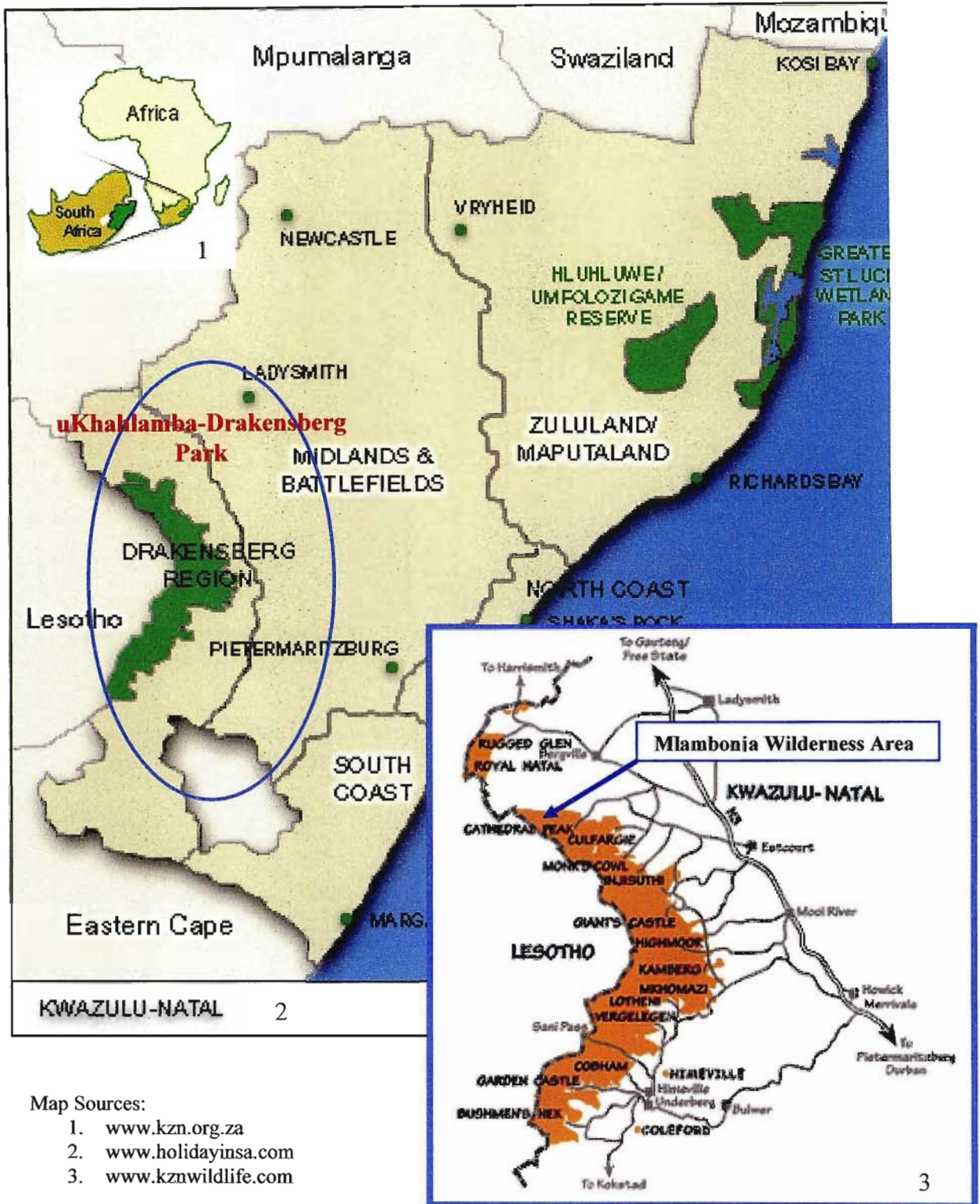
Appendix A

Legal Definition of Wilderness from the U.S. Wilderness Act of 1964

A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been effected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or features of scientific, educational, scenic, or historical value.

Appendix B

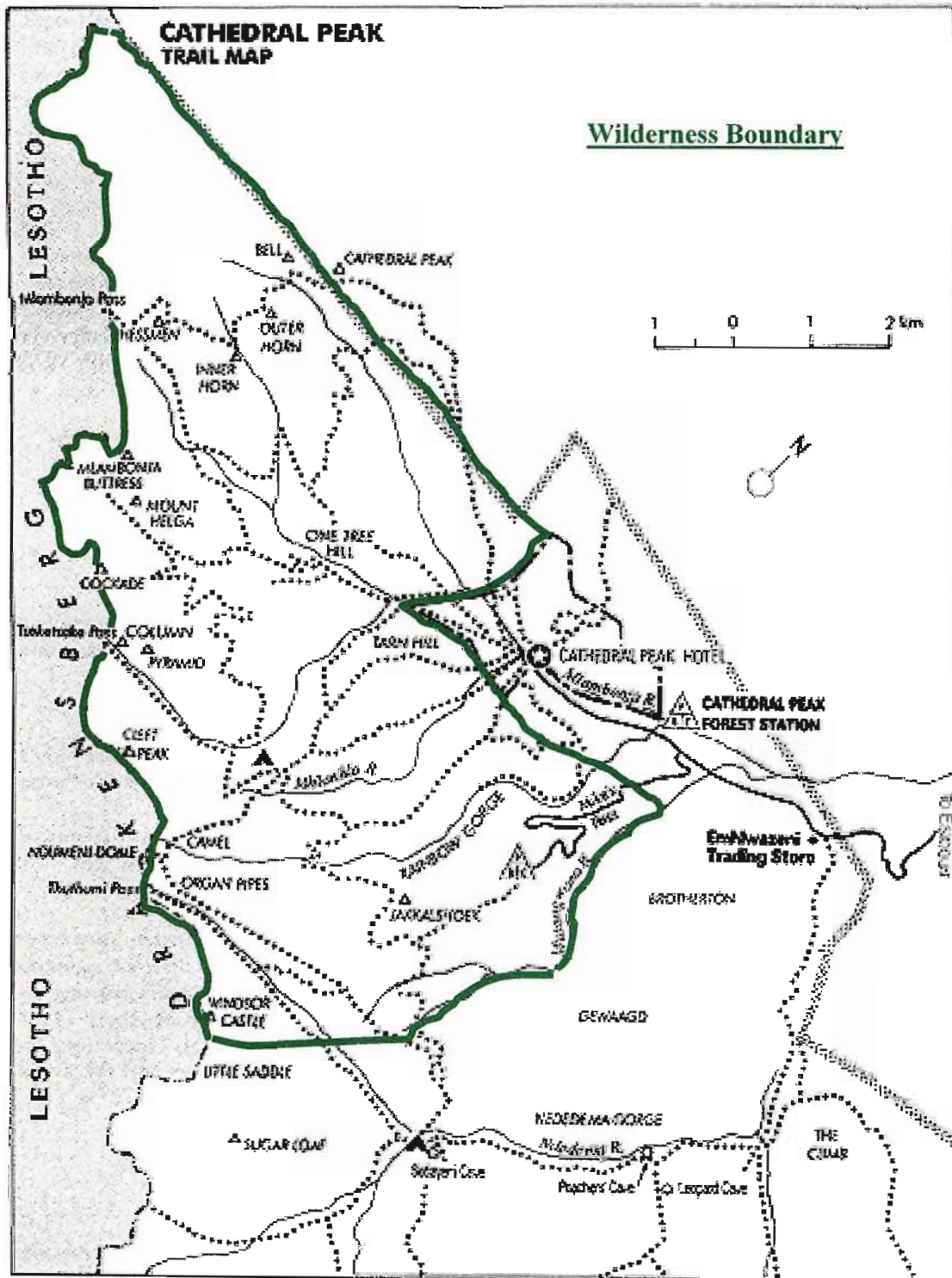
General Location Maps of the Mlamboja Wilderness Area



Map Sources:

1. www.kzn.org.za
2. www.holidayinsa.com
3. www.kznwildlife.com

Specific Location Map for Mlamboonja Wilderness Area



Map Source: www.gorp.com

Appendix C

- the role of the Department of Environmental Affairs and Tourism in biodiversity and environmental conservation in South Africa.

The KwaZulu-Natal Nature Conservation Service:

- pledges its co-operation to all other local, regional, national and international biodiversity and environmental conservation authorities;
- confirms its commitment to and support for the communities and publics its services and with whom it interacts; and
- dedicates its staff to the fulfilment of its mission.

The core strategies developed in order to achieve the Mission are:

i) Universal acceptance of the value of biodiversity conservation

Objectives:-

- to use biodiversity conservation as a basis for environmental education and awareness programmes, and to promote appropriate environmental ethics;
- to demonstrate the aesthetic values and economic contributions of biodiversity conservation and ecotourism;
- to expand the diversity and enhance the quality of products and services;
- to build powerful alliances.

ii) Contribution to social stability and economic development in the region

Objectives:

- to provide and support Conservancies, Biosphere Reserves and Community Conservation areas;
- to support, promote and develop ecotourism as an industry;
- to support, promote and develop the sustainable use of wildlife and protected areas;
- to use formally protected areas as a catalyst for development, especially in rural areas, through:
 - encouraging infrastructural development;
 - stimulating local entrepreneurship;
- empowerment of local communities through training and transfer of skills;
- initiating and supporting local community projects;
- optimising local employment opportunities;
- seeking and channeling funds to address community needs through for example the Community Trust;
- empowerment of local communities through the development of partnerships in ecotourism activities.

iii) Adequate financial resources

Objectives:

to ensure that the State recognises biodiversity conservation as a foundation of economic development and provides adequate subsidisation;

to use the Provincial subsidy effectively and efficiently in the best interest of biodiversity conservation;

to optimise the generation of funds from ecotourism, sustainable use of wildlife resources and other services;

to generate additional funds through joint ventures, concessions sponsorships, donations and contributions;

to actively support the KwaZulu-Natal Conservation Trust, Wildland's Trust and Isivuno, established to assist the Service in meeting its conservation responsibilities;
to generate international financial support;
to manage assets and resources efficiently.

iv) Provincial, parastatal biodiversity conservation structure for the management of integrated biodiversity conservation activities throughout KwaZulu-Natal

Objectives:

- to demonstrate the effectiveness, flexibility and success factors of the Service as a provincial parastatal biodiversity agency;
- to demonstrate competence, expertise, credibility and effectiveness at local, regional, national and international level;
- to demonstrate relevance and commitment to and knowledge of KwaZulu-Natal.

v) Shared vision and commitment throughout the Service and Board

Objectives:

to pursue the appointment of a well-balanced Board with representatives of appropriate skills and knowledge, previously disadvantaged groups and traditional authorities;
to recruit, develop and retain competent, skilled and committed staff;
to ensure effective internal communications;
to empower and uplift staff from disadvantaged backgrounds to enable them to fulfil their potential;
to pursue participatory management practices.

vi) Excellence of products and services

Objectives:

- to comply with the standards required for sound environmental management;
- to develop facilities which set the highest standards for environmentally sensitive development in protected areas;
- to meet the broadest spectrum of demands of the public for biodiversity based products and services, within a sustainable framework, environmentally, socially and economically;
- to strive for the development of research excellence and exemplary management practice in all relevant disciplines.

The Service believes that it has already made a significant contribution to the recognition of biodiversity conservation. KwaZulu-Natal has a rich biodiversity conserved through an extensive system of protected areas and conservation-orientated private sector management systems such as Conservancies, Community Conservation Areas and Biosphere Reserves. The economic value of KwaZulu-Natal's wildlife resources has been quantified to the extent that it can be seen to be making a substantial contribution to commerce, social stability and the economic needs of this Province and its people.

The economic and social contributions of KwaZulu-Natal's protected areas to adjacent communities are increasingly invaluable and widely appreciated.

Given that social stability will be achieved in South Africa in general, and KwaZulu-Natal in particular, the Service believes that the demand for wildlife resources, both consumptive and through ecotourism, will increase exponentially employment opportunities and increased prosperity.

Accepting the State's responsibility for funding the public good generated by biodiversity conservation, it is the Service's firm conviction that a regional nature conservation agency with statutory autonomy, a system already proven in South Africa and aspired to by other countries such as Kenya and Zimbabwe, is the best guarantee of the most rapid achievement of the Service's vision.

Appendix D

Excerpt from the Draft UDP Wilderness Management Plan

25.4 Public (at large)

Educational Material

- Talks can be given e.g. At Farmer's days.
- Information can be given out at Tollgates.
- "Enviro facts" booklets can be produced for wilderness; informing the public about the definition of wilderness, ethics and philosophy, and educating the public on the values of wilderness.
- An attempt should be made to encourage the general public to use the term "wilderness" in accordance with the definition adopted by this Management Plan. The reason for this is so that when the term "wilderness" is used in association with a particular area or experience, the general public know what to expect. The emphasis will be on improving the understanding of the wilderness code of ethics.
- Theatre productions / plays, radio and television are another form of successful communication.
- Wilderness information can be linked to talks shows to schools already in progress on cranes, swallows etc.
- Interpretive posters on "Wilderness in the UDP" can be given to schools.
- The media must be used as a "vehicle" for attaining the goal of promoting the wilderness ethic.

Actions

- * Approach the Maloti-Drakensberg Transfrontier Conservation and Development Project for funding for a poster and pamphlets. Other funding options are the tourism authority for the berg, poverty relief, Wildlands Trust and wilderness foundation.

25.4 Public users (see above)

Training

- A two day very basic wilderness course and LNT course for school teachers, hiking and backpacking clubs, police, army, AMAFA, trail guides, custodians, hotel trade.

Educational Material

- Literature must be placed at the gate. Perhaps also given to people when they make reservations.
- A section on wilderness should be included on the back of the hiking maps. People must be included- It must be clear that wilderness includes people.
- Provide an interpretive display on the UDP Wilderness Area at the main camps. These will include a series of panels i.e. for fire management, wilderness, rock art etc.
- Basic interpretive material must be available. Integrated interpretation.
- Pamphlets- on the do's and do nots in wilderness e.g. toilet hygiene- squits and squats and Leave no Trace principles. Pamphlets should include a definition and vision as well as general regulations (group size, safety, fire).
- Provide the user with useful interpretive material on wilderness values, ethics, etc, which would include education materials and no-trace camping ethics, etc, (provide a spectrum of wilderness education).
- The emphasis will be on improving understanding of the wilderness code of ethics, rather than regulation enforcement. Regulations must be presented in a positive, simple manner. Law enforcement should be provided at a level commensurate with the wilderness objectives and situation.
- Guided trails should enhance wilderness awareness by developing and expanding on the aims and objectives of wilderness through practical demonstration.

Actions

- * Action for pamphlets: obtain the existing pamphlets and see what's missing. Incorporate the wilderness information into the existing one.
Must prioritise the information that we can get across in these pamphlets.
- * Approach the Maldrak for funding for a poster and pamphlets. Other funding options are the tourism authority for the berg, poverty relief, Wildlands trust and wilderness foundation.

Appendix E

Name _____ Wilderness _____

Date ___/___/___

Planning Stage

1. Percentage of wilderness related information on agency website related to either knowledge, skills, attitudes or behaviours. High Med Low Very Low None

Number of individual information sources 1 2 3 4 5+

Comments _____

2. Percentage of wilderness related information in printed form at the agency reservations office related to either knowledge, skills, attitudes or behaviours. High Med Low Very Low None

Number of individual information sources 1 2 3 4 5+

Comments _____

3. Percentage of wilderness related information in visual media form at the agency reservations office related to either knowledge, skills, attitudes or behaviours. High Med Low Very Low None

Number of individual information sources 1 2 3 4 5+

Comments _____

High= 100%-76%, Med = 75%-51%, Low = 50-26%, Very Low = 25%-1%,
None = No Wilderness Information Present

Name _____ Wilderness _____ Date ___ / ___ / ___

Pre-Trip Stage

1. Percentage of wilderness related information in **printed form** given at the entrance gate related to either knowledge, skills, attitudes or behaviours.

High Med Low Very Low None

Number of individual information sources 1 2 3 4 5+

Comments _____

2. Percentage of wilderness related information in **printed form** at the visitor centre related to either knowledge, skills, attitudes or behaviours.

High Med Low Very Low None

Number of individual information sources 1 2 3 4 5+

Comments _____

3. Percentage of wilderness related information in **printed form** in the parking area related to either knowledge, skills, attitudes or behaviours.

High Med Low Very Low None

Number of individual information sources 1 2 3 4 5+

Comments _____

High = 100%-76%, Med = 75%-51%, Low = 50-26%, Very Low = 25%-1%,
None = No Wilderness Information Present

Name _____ Wilderness _____

Date ___/___/___

Trip Stage

1. Percentage of wilderness related information in **printed form** given on trailhead signs related to either knowledge, skills, attitudes or behaviours.

High Med Low Very Low None

Number of individual information sources 1 2 3 4 5+

Comments _____

2. Percentage of wilderness related information in **printed form** in the field related to either knowledge, skills, attitudes or behaviours.

High Med Low Very Low None

Number of individual information sources 1 2 3 4 5+

Comments _____

3. Percentage of wilderness related information in **verbal form** received from field staff in the field related to either knowledge, skills, attitudes or behaviours.

High Med Low Very Low None

Number of individual information sources 1 2 3 4 5+

Comments _____

High= 100%-76%, Med = 75%-51%, Low = 50-26%, Very Low = 25%-1%,
None = No Wilderness Information Present

Post-Trip Stage

1. Percentage of wilderness related information in **printed form** in the parking area related to visitor feedback on either knowledge, skills, attitudes or behaviours.

High Med Low Very Low None

Number of individual information sources 1 2 3 4 5+

Comments _____

2. Percentage of wilderness related information in **printed form** in the visitor centre related to visitor feedback on either knowledge, skills, attitudes or behaviours.

High Med Low Very Low None

Number of individual information sources 1 2 3 4 5+

Comments _____

3. Percentage of wilderness related information on agency website related to visitor feedback on either knowledge, skills, attitudes or behaviours.

High Med Low Very Low None

Number of individual information sources 1 2 3 4 5+

Comments _____

Component B

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- Appendix B:** Refined Set of Criteria
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List of Abbreviations

- QEP-** Queen Elizabeth Park
- UDP-** uKhahlamba-Drakensberg Park
- WISE-** Wilderness Information Systems for Education

1. Introduction

This section is intended to be a brief review of the methodology used during this study. The impact of this review of the overall process should be two-fold. Firstly, it will serve as a reminder of the steps undertaken in the methodology process and discussed prior to this paper. Secondly, it will clarify the points in the methodology process this paper begins and how the two papers are interrelated. A more detailed discussion of each of the steps in the methodology process can be found in the previous paper.

The purpose of this study was to develop and propose a new wilderness information and education management framework that is focused at the system-wide level. System-wide in this context refers to the full range of locations and opportunities within the experience gained by wilderness visitors, where information and education management techniques should be implemented. The basis for development of the proposed management framework is founded in information from the international and national body of literature in the theoretical areas of behaviour modification, wilderness management and environmental education and interpretation. Additional information for the development of the proposed management framework was sourced from key informants and personal experience. Once developed, the proposed management framework was tested in the field using direct observation. A more detailed discussion of this process is found in Section 2. These results were then used to adjust, add to and refine the proposed management framework. The tested and refined management framework was then used to produce a user manual. The user manual serves two functions. The first function is to allow wilderness managers to begin inventorying, monitoring and improving their information and education systems almost immediately after completion of this study. The second function of the user manual is to serve as a wilderness education technique itself. This is discussed further in Section 3.4. In addition, recommendations are made for further research and management actions to improve wilderness information and education management in South Africa. These recommendations pertain to the provincial level, which includes the case study site, and the broader national level.

1.1 Review of Proposed Management Framework: Wilderness Information Systems for Education

The purpose of this section is to serve as a brief overview of the elements of the proposed Wilderness Information Systems for Education, or WISE, that were previously developed and then field-tested. This section does not include the WISE guidelines for the development of information and educational materials for two reasons. The first reason is that they were never intended to be tested as they are primarily a set of recommendations for the development of information and education materials and not part of the inventorying, monitoring or feedback elements of the proposed WISE framework. Secondly, their role and application within the refined WISE framework is discussed further in Section 3.4.

1.1.1 Conceptual Framework of the Proposed WISE Management Framework

There are two phases of discussion that underpin the conceptual framework of the proposed WISE management framework. The first phase of discussion defines four distinct educational stages of the wilderness experience. The distinctions between the four stages are based on location, type of educational techniques, stage specific objectives and the focus of the educational techniques. In addition, the second phase of discussion provides the complete conceptual framework illustrating the interaction between the four stages of WISE and the wilderness visitor experience. Below are brief reviews of the two underpinning discussions that serve as a foundation for the conceptual framework of the proposed WISE management framework.

Figure 1.1 illustrates the four unique stages of the education experience of the wilderness visitor. The stages are unique in that each have varying combinations of locations available for visitor contact with education materials; educational techniques that are viable for managers to use, objectives for the use of information and education techniques and the focus of those techniques.

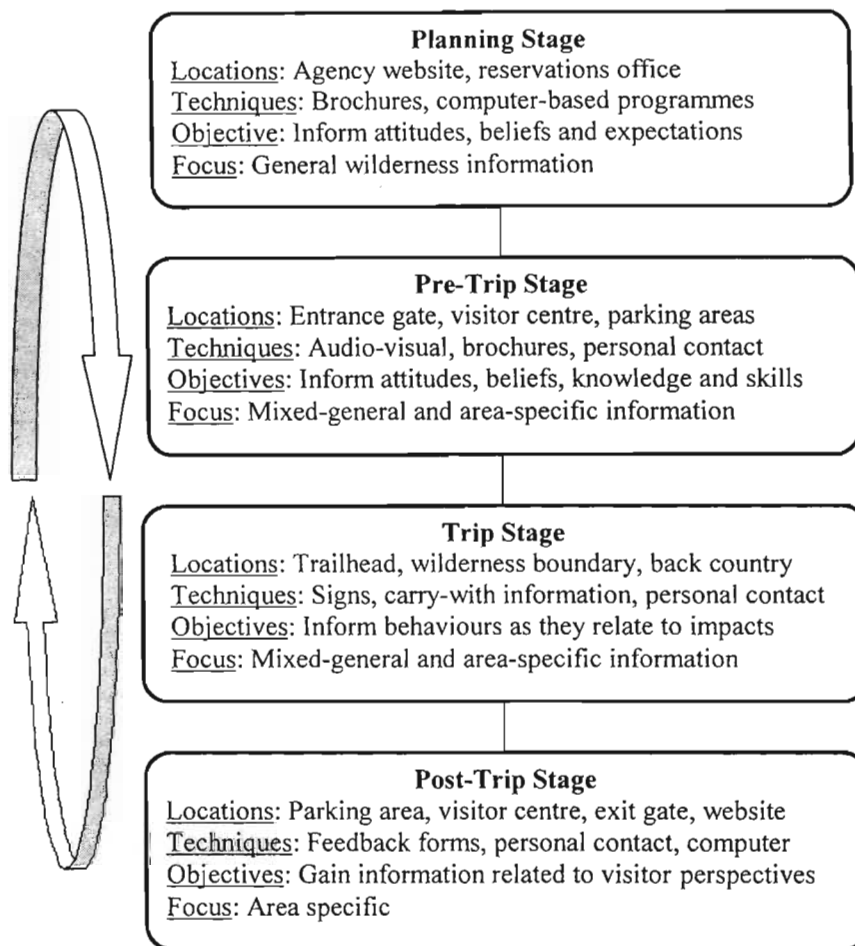


Figure 1.1 Proposed framework and example characteristics of the four stages of WISE

The second phase of the conceptual framework explains the complete foundation for the proposed WISE management framework and illustrates three very important points. This is accomplished by combining the four education stages of WISE and the visitor's recreation experience. Firstly, the stage at which information and education can impact upon the decision-making by the visitor is made explicit. Secondly, the complete conceptual framework illustrates how information and education can impact the decisions of a wilderness visitor. Lastly, the limitation of information and education systems becomes apparent as it is illustrated that they play a limited role during such stages as the trip stage. Figure 1.2 illustrates the complete conceptual framework for the proposed WISE management framework.

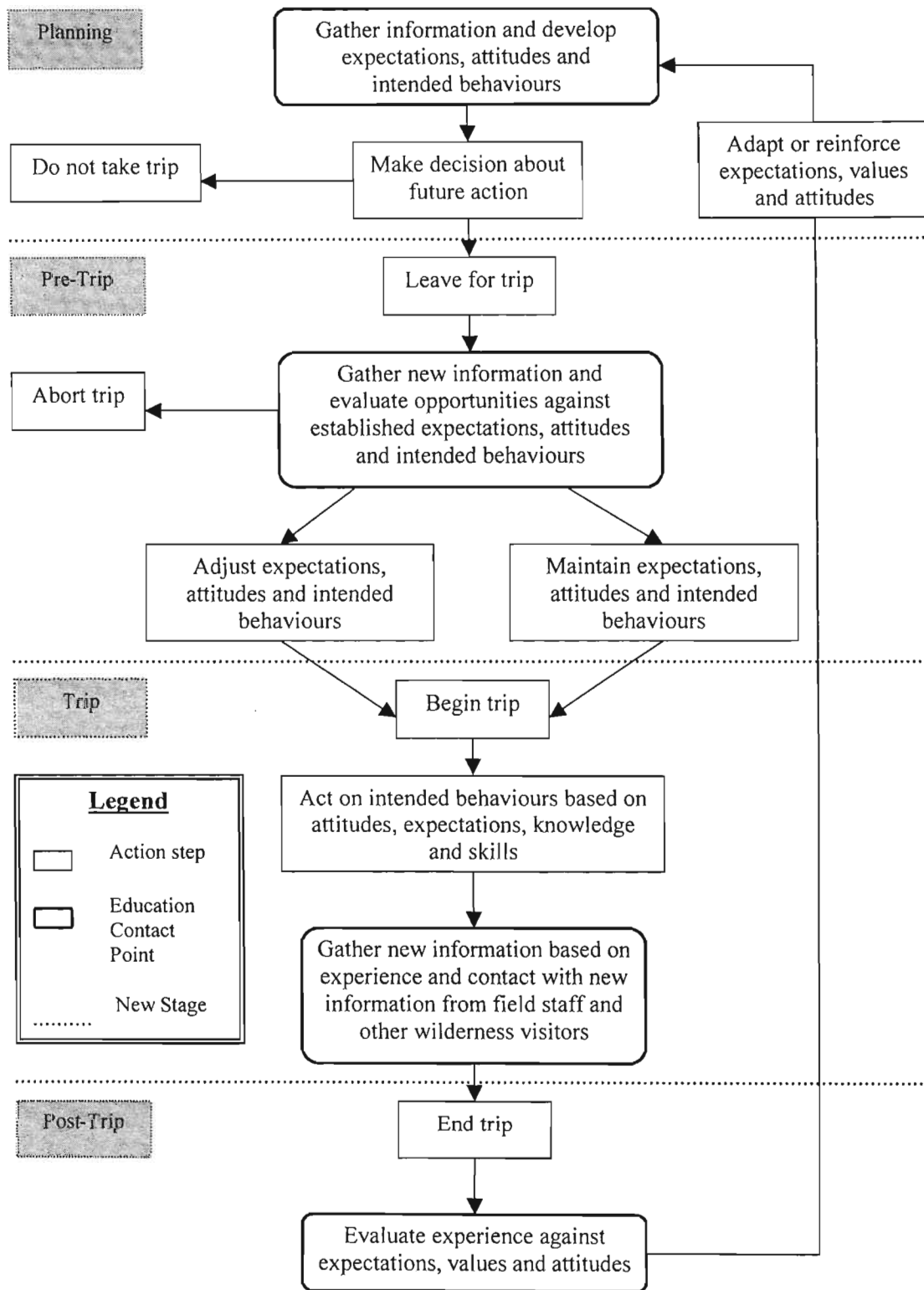


Figure 1.2 Proposed conceptual framework for WISE management framework

1.1.2 Proposed WISE Criteria

The proposed WISE management framework includes a set of criteria to be used in the evaluation process. The development of these criteria was based on the literature review, information from key informants and personal experience. Within the proposed WISE management framework the criteria are intended to serve as a tool for inventorying, monitoring and evaluating the entire on-site wilderness information and education system. In areas where little or no efforts have previously been made to inventory the wilderness information and education system the WISE criteria will serve as a simple and effective way to gather baseline data. Once this baseline data is available, the criteria can be used to monitor the wilderness information and education system at an interval determined to be appropriate by management. Monitoring will permit management to evaluate their successes and shortcomings in accomplishing management goals and objectives for the information and education system. Clearly, the use of the WISE criteria in an active manner will prove to be a powerful asset for adaptive management in that it will allow management strategies to adapt to changing social and environmental conditions. The proposed criteria are listed in Table 1.1. Specific discussion on the rationale for each of the criteria has been provided in previous papers.

Table 1.1 Listing of proposed criteria

Criteria	
Planning Stage	<ol style="list-style-type: none"> 1. Percentage of wilderness related information on agency website related to either knowledge, skills, attitudes or behaviours. 2. Percentage of wilderness related information in printed form at the agency reservations office related to either knowledge, skills, attitudes or behaviours. 3. Percentage of wilderness related information in visual media form at the agency reservations office related to either knowledge, skills, attitudes or behaviours.
Pre-Trip Stage	<ol style="list-style-type: none"> 1. Percentage of wilderness related information in printed form given at the entrance gate related to either knowledge, skills, attitudes or behaviours. 2. Percentage of wilderness related information in printed form at the visitor centre related to either knowledge, skills, attitudes or behaviours. 3. Percentage of wilderness related information in printed form in the parking area related to either knowledge, skills, attitudes or behaviours.
Trip Stage	<ol style="list-style-type: none"> 1. Percentage of wilderness related information in printed form given on trailhead signs related to either knowledge, skills, attitudes or behaviours. 2. Percentage of wilderness related information in printed form in the field related to either knowledge, skills, attitudes or behaviours. 3. Percentage of wilderness related information in verbal form received from field staff in the field related to either knowledge, skills, attitudes or behaviours.
Post-Trip Stage	<ol style="list-style-type: none"> 1. Percentage of wilderness related information in printed form in the parking area related to visitor feedback on either knowledge, skills, attitudes or behaviours. 2. Percentage of wilderness related information in printed form in the visitor centre related to visitor feedback on either knowledge, skills, attitudes or behaviours. 3. Percentage of wilderness related information on agency Website related to visitor feedback on either knowledge, skills, attitudes or behaviours.

1.1.3 Proposed WISE Evaluation Form

The last element of the proposed WISE management framework that was field-tested was the form design used to operationalize the criteria. An illustration of the various elements included in the form is provided in Figure 1.3.

1. Percentage of wilderness related information on agency website related to either knowledge, skills, attitudes or behaviours. ☆ ↑

High Med Low Very Low None

Number of individual information sources 1 2 3 4 5+

Comments _____

Figure 1.3 Example of elements of the proposed evaluation form

KEY

☆ # = Element to be explained below
 High = High percentage rating
 Med = Medium percentage rating

Low = Low percentage rating
 Very Low = Very Low percentage rating
 None = No materials present

Element 1 represents the criterion that is to be evaluated for the purposes of inventorying and monitoring. Element 2 is the scale used to rate the level of occurrence of the identified criterion. The definition of these scores is as follows: High= 100%-76%, Med= 75%-51%, Low= 50%-26%, Very Low= 25%-1%, None= No wilderness information present. Element 3 is used for the purposes of setting the context for element 2 and increasing resolution. The percentage of occurrence is only useful if the total number of sources is known. Element 4 is used to convey any information the administrator of the evaluation form might feel is needed to clarify the information for the manager. This will also add to the resolution of the evaluation form. A more detailed discussion of the rationale and use of evaluation form was provided in the previous paper so will not be discussed repeated here.

2. Results of Direct Observation Methodology

It is important that it be made explicit that the intent of this study is not to evaluate the value of information and education systems found within EKZN Wildlife and the Mlambojha Wilderness Area. Rather, the intent is that the results from this study will be employed to refine the proposed WISE management framework. This, in turn is intended only as an inventory and monitoring tool. Only when the results of the inventory and monitoring are compared to established EKZN Wildlife management goals, will the quality of the wilderness information and education system be determined. However, the initial field-testing results can be used as a means of demonstrating this process. For example, after administering the proposed criteria evaluation form for all four stages of WISE, it was found that only two source of wilderness related information existed, both being found in the planning stage. These sources of information contained a very low percentage of information, related to either knowledge, skills, attitudes or beliefs. While no established goals and objectives for wilderness information and education in the UDP may exist, a broad assessment of the system's development can be determined.

Based on the information found in the relevant literature, the fact that these wilderness areas have been proclaimed for about thirty years, and the current level of use of information and education management techniques, this study as demonstrated that the current wilderness information and education system in the UDP is at a very low level of development. This fact supports the need for a management framework, such as is proposed by this study.

As was discussed in detail in earlier works, the aim of the field-testing phase of this study is to determine the level of development of the proposed wilderness information and education management framework, the processes of testing it and refinement of the original proposed framework. It was not feasible, due to the constraints discussed above, to attempt to collect and analyse raw data. For this reason, the implications of the results for this study are equally shared between the results and the discussion of the refined elements of the proposed WISE management framework in Section 3. It is important for this study that the pre-site visit and direct observation steps in the methodology be discussed here for two reasons. The first is to improve the

transparency of the study by making explicit the actions taken and how they were carried out. The second reason is to demonstrate the developmental context within which the proposed WISE management framework exists.

2.1 Pre-Site Visit

The pre-site visit was carried out over two days. The first day included the following:

- Examine the Planning stage by visiting the EKZN Wildlife website and reservations office at Queen Elizabeth Park (QEP);
- Examine the Pre-Trip stage by reviewing the entrance gate to Cathedral Peak, the visitor centre and the parking area at a trailhead for the Mlamboja Wilderness Area;
- Initiated examining the trip stage by reviewing a trailhead area for the Mlamboja Wilderness Area and spent the night in Xeni Cave.

The second day included the following:

- Completed examining the trip stage by passing the trailhead area and leaving the Mlamboja Wilderness Area;
- Examine the Post-Trip stage by reviewing the parking area, visitor centre and exit gate to Cathedral Peak;
- Coordinated the logistical details for the direct observation phase of the study.

The pre-site visit successfully accomplished three goals. The first goal was to investigate the case study site and four stages of WISE, in order to inform the initial development of the foundation framework and criteria. This initial visit provided information into the reservation process, opportunities for contact with education and types of information and education techniques available during various stages. The second goal was to familiarize the staff at the case study site with the study. This was accomplished through coordination from the EKZN Wildlife staff coordinator of the project and contact with the visitor centre's front desk staff. The last goal of the pre-site visit was to clarify the logistical needs of the direct observation period. This was accomplished as requests for assistance for accommodation and access to the study site during direct observation were identified and coordinated with the EKZN Wildlife staff.

2.2 Direct Observation

Direct observation consisted of administering the WISE criteria evaluation form to the four stages of WISE. Multiple administrators were used to reduce bias. In addition, the evaluation form was administered in different locations within the case study site over a one-week period. The Planning stage was carried out prior to proceeding to the study site by administering the evaluation form for the agency website and reservations office located at the agency headquarters. The pre-trip stage began once direct observation proceeded to the study site and passed through the entrance gate. Administration of the evaluation form continued as coordination with the EKZN Wildlife staff once again took place at the reception desk of the visitor centre. At this point, a base for operation was established in a campground area near the entrance gate of Cathedral Peak. From here, four different single-day trips were made into the Mlambonja Wilderness Area by the administrators of the WISE criteria evaluation form. These field locations are illustrated in Appendix A.

It is important to mention that the planning stage was the only one of the four stages of WISE to be evaluated once by the administrators. The pre-trip, trip and post-trip stages were evaluated four times since. Once at the study site, a wilderness visitor would be within one of the later three stages, and each trail or different trip can be viewed as unique. However, as the planning stage would be similar to any of the trips taken into the case study site, the negative effect of this on the results would be minimal. The following is a more detailed discussion of the information and results gained from testing the process of administering the WISE criteria evaluation form for the four stages of WISE.

2.2.1 Direct Observation Results

Results from direct observations pertain to the study and or the proposed WISE management framework in three principal areas. These inform the context and underlying reasons for many of the specific observations. These three areas include the implications for testing the criteria themselves in such a developmental context, an understanding of the differences between day and overnight visitors and insight into the high value and potential impact of parking areas and trailheads in particular in the wilderness visitor's education experience. With an understanding of these general or underlying observations in combination with the form and stage specific observations,

a foundation was set for discussion of the various refined elements of the proposed WISE management framework.

The limited amount of results or raw data from the evaluation forms has important implications for the study. Essentially, there are only two sources of information related to wilderness specifically and both received a very low percentage score of information related to either knowledge, skills, attitudes or beliefs. Both sources were located in the planning stage, one source was the agency website and the other was an official pamphlet. Consequently, the pre-trip, trip and post-trip stages showed a 0% occurrence of information and education materials related to wilderness. While these results have little impact on the testing of the various aspects of the proposed management framework, they are important for understanding the need for and current status of wilderness information and education system for the UDP. The multiple administrators of the evaluation form confirmed these results. The main implication for the study is that it is difficult to evaluate the criteria themselves in the pre-trip, trip and post-trip stage, as there were no wilderness information or education materials present. This does not invalidate the testing of the process of administering or the selection of the criteria. It only implies that the criteria can not be tested fully until a wilderness information and education system has been developed. These results in conjunction with EKZN Wildlife's expressed desire to develop their wilderness information and education system further (Krueger, *pers com*) illustrate just how early the wilderness information and education system is in its development. Thus, clarifying the need and applicability of formative research focused on processes more than evaluation of the system itself. The extremely low level of data available is also important as it illustrates what realistic expectations for such an early study should be. It is not possible to evaluate a wilderness information and education system until it has been in operation for some time.

Direct observation also indicated some distinct differences between day and overnight visitors that should be taken into consideration. This became evident when the researchers encountered different opportunities for wilderness information and education during the direct observation day trips then during the pre-site visit overnight trip. The typical educational experience of an overnight visitor is the process explained in the pre-site visit description. A wilderness visitor will make

contact with EKZN Wildlife by personal contact, email or telephone in order to book the necessary overnight permits. Contact is again made at the entrance gate, the reception office of the visitor centre to sign the mountain register and the parking area. The trip stage will essentially be the same for both overnight and day visitors. It consists of having an experience in the wilderness area. The overnight visitor then encounters the parking area, visitor centre to sign out of the mountain register and the exit gate. In contrast, a day visitor can have a wide variety of educational experiences. They range from very similar to an overnight visitor with many contacts with agency locations to only contacting a few education points managed by EKZN Wildlife. For example, in the case study site there is a private hotel located inside the park boundaries. During direct observation the vast majority of visitors encountered on the trails were from this location. Since the hotel guests are not required to go to the visitor centre they can encounter relatively fewer points of information and education managed by EKZN Wildlife. They are only required to come into contact with educational information at the entrance gate before going directly to the hotel, which even provides its own trailhead system. In addition, direct observation noted other visitors to the case study site from the campgrounds or hutted camps. These locations should be considered important locations to consider for criteria.

While the process of contacting agency controlled information and education sources is different between day and overnight visitors the similarities are just as, if not more informative. Thus, the third area of general results is the important role that three particular education contact points play in the WISE management system. The entrance gate, parking areas and trailheads are the only locations that every wilderness visitor must encounter. This raises their potential importance. However, for various reasons it becomes clear that not all three locations have the same potential level of influence. Entrance gates can only serve a limited purpose as wilderness visitors are only stopped momentarily and do not get out of their car. Thus, information and education techniques are limited to brief pamphlets and other general signs. Similarly, trailheads are generally located along a trail some distance from where visitors may have started hiking. As a result, wilderness visitors are less likely to engage information sources once they have started hiking. However, trailheads do play a potentially more influential role than entrance gates. This is largely due to the fact that a wilderness visitor has more freedom of choice and ability to engage

wilderness information and education than when at an entrance gate where they also deal with extraneous issues such as fees, firewood purchases and accommodation. Of the three locations, both managers and visitors could consider parking areas the most practical and effective location for three reasons. The first reason is that parking areas are the only transition point between zones when a visitor is outside of their car and has a relatively large amount of idle time. Visitors are generally getting ready for their trip but are not yet hiking or are waiting for others in their group to come off the trail. Thus, this contact point gives more freedom and ability to engage with more in-depth wilderness information. As a result, this setting is the most favourable for addressing complicated issues such as knowledge, skills, attitudes and beliefs. A second reason why parking areas may be seen as the most important location for education contact is that it is present in two of the stages. As was already mentioned, it provides the greatest amount of freedom for visitors to engage education materials that require more time or active interaction, such as feedback forms. The last reason that parking areas may be the most favoured location by managers and visitors is that there is already a strong presence of management and development. For example a trailhead area for a wilderness would be expected to have very little presence of man's actions as defined in part of the internationally recognized wilderness philosophy. This severely limits the amount of management options for information and education techniques. This contrasted with a highly impacted parking area which is expected by everyone to be a location that has a high level of presence of management action and modification. This makes parking areas a highly accepted area for the presence of information and education materials.

The general issues raised in the testing of the application of the WISE criteria evaluation form establish a strong foundation from which the specific issues can be raised. This discussion is provided below.

2.2.2 Design of the WISE Criteria Evaluation Form

The combined comments from the multiple administrators of the WISE criteria evaluation form produced several valuable recommendations. These recommendations are summarized below. These recommendations will be used to improve and add value to the refined WISE criteria evaluation form design, discussed in Section 3.3.

The initial proposed form design limited each stage in WISE to only three criteria each, for reasons discussed in earlier works. Comments from the administrators suggest that it would be more beneficial if the number of criterion in each stage reflected the role or level of the potential impact they could have. As was discussed in section 2.2.1, some stages have a greater potential to influence visitor behaviour. For example, there is very little that managers can do once a wilderness visitor is in the trip stage as opposed to the many opportunities provided in the pre-trip stage. As a result, each stage should contain a number of criteria appropriate to their specific roles.

In the proposed form design, it is not possible to conclude whether the wilderness related information is general or area-specific. Capturing this information would serve two functions. The primary function would be to improve the resolution of the evaluation form. It is much easier to have an administrator who is already evaluating the system record this information than attempt to do it through some other disjointed effort. The secondary would assist in connecting the evaluation form more closely with the four stages of WISE, thus enhancing the systems-wide approach.

Even at this early stage in the development of inventorying and monitoring the wilderness information and education system, it would be beneficial to narrow the focus of the criteria further. For this reason, the large category of “knowledge, skills, attitudes and beliefs” would function better if broken into two separate groups. Knowledge and skills should be put into one group as they are closely related, and attitudes and beliefs should be a separate group for the same reason. For reasons of ease of administering the evaluation form it was noted that the closely related groups of “knowledge and skills” and “attitudes and beliefs” should not be broken down further.

The last three issues all relate to the scales used on the form. Firstly, the scale for the percentage of information found should be redefined. The categories of High, Medium, Low, Very Low and None are satisfactory but the way in which they are defined created some problems. It may be difficult for an administrator of the evaluation sheet to readily distinguish between 45% and 55%, which could have important implications for the score given. For this reason, the terms have been

redefined as follows. High= Approximately All, Med = Approximately $\frac{3}{4}$, Low = Approximately $\frac{1}{2}$, Very Low = Approximately $\frac{1}{4}$ and None = No wilderness information present. This adjustment should improve the ease and accuracy with which an administrator of the evaluation form can rate approximate percentages. While the number of individual information sources provides a good context for the percentage score, it was noted that further understanding of the total number of sources would be beneficial. Another category should be added to include an inventory of all material present, not just that related to wilderness. Lastly, an “0” category on the scale on number of sources should be included in order to match with the “None” category of percentage of compliance with criteria.

2.2.3 The Planning Stage

Direct observation during the planning stage provided three important insights that inform the refining of the proposed criteria.

Observation One

There are many ways in which a wilderness visitor is able to make a reservation. In addition to making a booking in person at the reservations office at QEP, visitors can make reservations by email, post and the telephone. Front desk staff at the reservations office at QEP indicated that while specific numbers are not known, it is suspected that the majority of reservations are made using the latter three options. There is a common link between these three methods of making a reservation that lends itself to easily be included in the set of WISE criteria. In all three methods, the act of making a reservation will result in the wilderness visitor receiving information in the mail along with the confirmation of their booking. It is important that these methods be included in the refined set of WISE criteria if a comprehensive inventory and monitoring programme is to be established.

Observation Two

Requests made by visitors to staff for assistance play an important role. The multiple administrators of the evaluation form noted the danger that an observer might simply miss a source of information. This is why it is felt that it would be useful to include criteria on the form to indicate whether contacting a staff member increased the awareness of available information. Indirectly, this could also provide valuable

information about the level of knowledge that the staff have about the wilderness information and education system.

Observation Three

It was noted that the lack of information played an important role during the planning process. The multiple administrators of the evaluation form noted, and the literature (Manning & Lime, 2000) suggests that to a large extent, wilderness visitors utilize sources of information such as guidebooks, retail shops and formally organized user groups such as The Mountain Club during the planning stage of WISE. While the coordination and evaluation of these information sources is beyond the scope of WISE, it is important to realize the important role that these sources of information play when discussing recommendations to improve WISE in South Africa. This is discussed further in Section 4.2.

2.2.4 The Pre-Trip Stage

Results from the direct observation specific to the pre-trip stage revealed three important issues.

Observation One

The first important observation is that day and overnight visitors have different opportunities to come in contact with educational information. As previously discussed in Section 2.2.1 special consideration should be given in order to accommodate the various types of wilderness visitors. Primarily, the criteria should include locations such as the picnic sites, campgrounds and hutted camp areas, as these are key locations for educational contact for various day visitors. This is even more important for the campgrounds, picnic areas and hutted camps that are generally associated with or located near a reception or visitor centre.

Observation Two

The second important observation for the pre-trip stage is that where present, curio shops can play a unique and important role in providing education and information to a wide range of visitors. The curio shop is an excellent location to provide information and relevant products related to the full range of wilderness values. Knowledge and skill information can be provided in the form of books related to

wilderness activities such as trail guidebooks, Leave No Trace principles or “how to” books for travelling in wilderness areas such as those provided by the National Outdoor Leadership School (NOLS). Information about wilderness attitudes and beliefs can be provided through the sale of books by South African authors such as Player and Muir. Relevant products could include biodegradable soaps, fuel for camp stoves and other products related to the Leave No Trace practices that wilderness managers encourage for visitors to use. Curio shops are a chance to inform both day and overnight visitors to the wilderness areas, as well as the general public who may have little or no intention of venturing into the wilderness areas but have an important role in the general public’s understanding and support for wilderness values.

Observation Three

It was again noted that mentioning ones intentions to enter a wilderness area to the agency staff may increase ones likelihood of encountering or receiving wilderness related information at locations such as the entrance gate and reception area.

2.2.5 The Trip Stage

There are three primary observations made during the trip stage that inform the refining of the set of WISE criteria.

Observation One

Due to issues of limited resources the primary function of EKZN Wildlife field rangers is to patrol for biological monitoring and law enforcement purposes to control illegal activities such as poaching, smuggling and grazing. In addition, even though daily patrols are undertaken, the chances of wilderness visitors encountering EKZN Wildlife field staff are limited by funding and capacity constraints. Consequently, it is considered inappropriate to inventory and monitor the information the wilderness visitors receive from EKZN Wildlife field staff during the trip stage.

Observation Two

It was noted during direct observation of the trip stage that the current design of the trails system poses some important challenges for information and education programmes. At the case study site there were at least five different trailheads within the same area. At times, multiple trailheads were present for one trail. The

implication of this for information and education programmes is two-fold. Firstly, the cost of producing and maintaining multiple trailhead signs can have negative impacts on already limited budgets. It would be more efficient to have fewer trailheads with higher quality information and education sources than to have multiple trailheads with lower level quality of wilderness information and education. Secondly, there is a risk in only providing information and education at selected trailheads. It would be ineffective to provide information at only certain trailheads, which may typically be used by overnight visitors, and neglect other trailheads used primarily by day visitors. In the long-term it would be more effective and efficient to limit the number of trailheads so as to maximise exposure of visitors to high quality wilderness information and education materials at trailheads.

2.2.6 The Post-Trip Stage

Direct observation during the post-trip stage is directly linked to the discussion of the importance of the role of the parking area in section 2.2.1. The observers noted that the amount of idle time spent in parking areas is a potential powerful opportunity for managers to get useful feedback information from wilderness visitors. Consequently, parking areas should receive a high level of priority in the set of WISE criteria.

The results from the direct observation and field-testing for the WISE criteria and evaluation form give clear indications for how the proposed WISE management framework can be refined. These changes are included and discussed in the following section.

3. Discussion of Refined WISE Management Framework

Direct observation and field-testing of various elements of the proposed WISE management framework have informed the refinement and improvement of those elements. The three areas tested were as follows:

1. The proposed WISE framework;
2. The proposed WISE criteria;
3. The proposed WISE criteria evaluation form.

The refinements and improvements to each of the field-tested elements are discussed further in this section. In addition, the manner of inclusion and operationalization of all the elements of the proposed WISE management framework into a user manual are discussed in detail.

3.1 Refined WISE Framework

Results from field-testing the conceptual framework that serves as the foundation for the proposed WISE management framework were very positive. It was observed by the administrators of the field-testing that the proposed conceptual framework was representative and comprehensive of what was found in the field. However, these results are of limited significance at this point, primarily due to the theoretical nature of the conceptual framework. As a proposed theory, it is necessary to subject the proposed conceptual framework to two forms of testing not available under the constraints of this study in order to properly evaluate and improve it. The first measure is high numbers of repeated testing. It is through these repeated measures that the real world applicability of the theoretical framework can be tested. The second measure is time itself. As more wilderness specific research is developed in South Africa and around the world, the underlying theories and assumptions of the proposed conceptual framework will be indirectly tested and evaluated. Clearly, these steps are needed in order to ensure the continuous growth and improvement of the proposed WISE management framework. However, it is also clear that these steps are outside the scope of this six month study. The overall result of field-testing being that the proposed conceptual framework remains essentially unaltered at this point.

3.2 Refined WISE Criteria

The results of field-testing the proposed WISE criteria yielded significant results in primarily three areas; the need to split knowledge/skills and attitudes/beliefs into separate criteria, the need to include other important locations in the criteria and the need to put more emphasis on stages that play more influential roles in the educational experiences of wilderness visitors. Each of these areas of results is discussed in further detail below. A complete list of the new criteria can be found in Appendix B.

In the proposed criteria it was assumed that at an early stage in the development of the proposed WISE management framework, it would be sufficient to test whether any of the identified topics (knowledge, skills, attitudes and beliefs) were present. However, results from field-testing indicate that splitting the identified topics into two separate groups would provide three advantages over the proposed single grouping. These are:

1. Field-testing indicated knowledge, skills, attitudes and beliefs lacked homogeneity as a group. However, two similar groupings were clearly present. The two groups were knowledge/skills and attitudes/beliefs.
2. The second advantage is that it would result in an increase in the resolution of the criteria. By splitting the identified topics into two groups, a higher quantity of specific information could be gained through the use of the criteria. It will be possible for managers to gather data specific to how much information is present for each of the two groups, as opposed to one point of information being gathered that would be relatively vague if all the topics were kept together.
3. Lastly, the higher level of resolution will allow wilderness managers to define more specific goals and objectives and increase their ability to inventory and monitor the wilderness information and education system.

During the field-testing it became clear that some important locations that serve as information and education contact points for wilderness visitors, were missing from the proposed set of criteria. Examples of such locations include information received via the post for reservations during the planning stage, as well as campgrounds, picnic areas and curio shops during the pre-trip stage. Consequently, the refined set of criteria includes the additional locations for possible visitor contact with wilderness

related information and education. The addition of these areas will increase the depth and overall coverage of the WISE criteria as an inventory and evaluation tool.

Lastly, the original proposed set of criteria was rationalised to evenly distribute the number of criteria between all four stages. However, field-testing indicated that it was more appropriate for the number of criteria in each stage to reflect the level of potential influence. As a result, stages where information and education techniques have a higher potential to influence wilderness visitors, more criteria should be included. This will help to guide management strategies more realistically as well as reinforce the system-level approach. The system-level approach will be reinforced by articulating that each stage is not equal, but rather has a role to play and it is the overall outcome that should remain the focus of management strategies.

3.3 Refined Criteria Evaluation Form

Field-testing of the proposed criteria evaluation form indicated that three additions would greatly improve the resolution, applicability and amount of information gathered during the administration of the form. Figure 3.1 illustrates an example of the new format elements for the refined criteria evaluation form. Discussion and rationale for each of these new elements is provided below.

N/A <input type="checkbox"/>	3. Percentage of wilderness related information in <u>printed form</u> at the <u>agency reservations office</u> related to knowledge and skills.	High <input type="checkbox"/>	Med <input type="checkbox"/>	Low <input type="checkbox"/>	Very Low <input type="checkbox"/>	None <input type="checkbox"/>	
★ ₁ ↑	Number of wilderness information sources	0 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5+ <input type="checkbox"/>
★ ₂ →	Number of total information sources	0 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5+ <input type="checkbox"/>
★ ₃ →	Overall focus of information is (please circle) General / Area Specific / Mixed						
	Comments _____						

Figure 3.1 Example of new elements of the refined evaluation form

New Element 1

The N/A or “Not Applicable” element was added primarily for two reasons. The first reason is that it might not be possible for all administrators of the WISE criteria evaluation form to answer all the questions. For example, an honorary officer who is responsible for administering the WISE criteria evaluation form in the Mlambonja Wilderness Area may be based in northern KwaZulu-Natal. As a result, it might not be feasible to evaluate the criteria related to the agency’s reservation office located at QEP. By checking the N/A box a manager would be informed that a particular criteria was not administered rather than the possibility that a question was just missed or skipped. This will aid in the improvement of quality assurance of information gathered during administering of the WISE criteria evaluation sheet. The second reason for providing the N/A option is that administrators of the WISE criteria evaluation form will generally strive to fill out the form as completely as possible. If there is not an option for not answering a question, administrators might be tempted or feel obliged to guess or estimate what the answer would be. This would lead to inaccurate information being fed into the database and diminish the integrity of the overall management framework.

New Element 2

While the proposed criteria evaluation form provided a means of establishing a context for the percentage of wilderness related information it was found that a certain level of context was still missing. It was indicated that knowing the total number of information sources available would provide two new points of information. The first point of information is an idea of how much of the total information and education provided to visitors is related to wilderness. The second point of information is what the total level of presence of information and education is in general. This may help to indicate where there is a general lack of information and education not just that related to wilderness specifically.

New Element 3

Field-testing of the criteria evaluation form indicated that there was a point of information from the conceptual framework that was not being adequately represented or evaluated on the criteria evaluation form. Figure 1.1 illustrates the proposed four stages of WISE and examples of their characteristics. One of the defining

characteristics of the stages of WISE is the focus of the information provided. The proposed criteria evaluation form did not have an element that addressed the need to inventory and monitor this unique characteristic. As a result, the refined criteria evaluation sheet includes a documentation of whether the information is general, area specific or a combination, thus providing added-value to the ability to monitor how closely information and education materials are linked to the guiding conceptual framework.

With the addition of the three new elements to the original four elements that were in the proposed criteria evaluation form, there are seven elements in total. This will increase the amount of information captured during the administration of the criteria evaluation form, as well as maintain the feasibility and manageability of filling out the form to ensure complete and accurate documentation of data.

3.4 WISE in the Drakensberg User Manual

The WISE in the Drakensberg user manual represents the primary output of this study in terms of applied research. It is intended that the user manual will be utilized by wilderness managers in the UDP immediately upon completion of this study. Included in the user manual is a brief explanation of what WISE is and how it serves as a wilderness management tool, the various elements of the proposed WISE management framework and the criteria evaluation form. The criteria evaluation form includes clear instructions, the form itself and a brief feedback questionnaire. With all these components, the user manual will serve two important functions; the collection of valuable data, and to serve as a wilderness information and education tool. A full example of the WISE in the Drakensberg user manual is provided in Appendix C.

The returned criteria evaluations forms will provide the data required to inventory and monitor the status of the wilderness information and education system in the UDP. This information will then be used to evaluate management's progress in meeting its established management goals. In addition, the feedback form that is included as part of the criteria evaluation form administration process provides valuable information that can be used to immediately begin to improve and refine the proposed WISE management framework. This establishes two important precedents early on in the development of the proposed WISE management framework. The first precedent is

that change is an expected and valued part of the management process. The second is that management of the wilderness information and education system is an ongoing and long-term commitment, rather than a once-off approach.

The second primary function of the user manual is that it will serve as a wilderness information and education tool in its own right. By providing the administrators of the criteria evaluation forms with this user manual for their retention, wilderness information and education can be indirectly distributed to members of relevant user groups such as the Wilderness Action Group, the Mountain Club and members of the general public. By increasing the user group's knowledge of management actions in the UDP it could become easier for EKZN Wildlife to coordinate wilderness education and information programs with other organizations, thus working towards the accomplishment of the recommendations as discussed in later sections.

4. Recommendations to Further Improve WISE in South Africa

In this section recommendations are made that pertain to various levels of management and government, in particular the provincial level of management for the UDP area and the national level for the Republic of South Africa. As a result, it is implied that the provincial level recommendations are made with the intent that EKZN Wildlife would benefit from the incorporation of these actions into their management strategies. However, the national level recommendations propose actions that are not entirely under the control or influence of EKZN Wildlife. Therefore, it is implied that the national level recommendations are intended for the broader audience of this study and that EKZN Wildlife would benefit from taking an active role in as much as their position allows.

4.1 In the uKhahlamba-Drakensberg Park

As was previously discussed, the proposed WISE management framework is an early step in the processes of developing wilderness specific, or even general, management frameworks for information and education systems for protected areas in South Africa. As result, it is vitally important that the developing management framework be established with a focus on short-term and long-term goals if visitor management issues are going to be successfully addressed. The following are four recommendations that, if addressed at the provincial level, would complement and further develop the proposed WISE management framework.

1. Direct observation suggests, and the relevant literature supports, the need for more research into developing evaluative measures to gauge the effectiveness of the proposed WISE management framework at two levels (Ham & Krumpel, 1996; Buckley, 2000; Cessford, 2000; Leung & Marion, 2000; Manning & Lime, 2000). The first level is the overall WISE management framework. While this is partially addressed in the WISE in the Drakensberg user manual, a far more in-depth evaluation should be developed so as to allow for continuous development and improvement of the overall system. The second level is that of the individual materials used within the larger proposed WISE management framework. An example of how this could be accomplished is through adaptation of the materials development guidelines provided for in the

WISE in the Drakensberg User Manual into an evaluation form for individual materials.

2. As discussed in greater detail in previous works, it is essential that wilderness user characteristics be employed to develop appropriate information and education materials. Thus, it is recommended that management strategies at the provincial level should be developed to incorporate efforts to gain feedback on wilderness user characteristics. Once this information is gathered it should then be used to improve the individual information and education materials. It is vital that this information be used to improve the proposed WISE system and not simply collected and left to just “sit on the shelf”, as is a common mistake of land management agencies (Ham & Krumpe, 1996).
3. Efforts should be made to link wilderness management practices and research at a provincial level. By doing this two things can be accomplished. The first is that more comprehensive testing of the application of the proposed WISE management framework in a range of environments and wilderness areas can take place. This will ultimately lead to a more rapid and more comprehensive improvement of the proposed WISE management framework. Secondly, this link will aid in the development of a more consistent understanding of wilderness values and concepts among managers and the general public. The key to achieving success in this area is for the links to go beyond the awareness level and be truly focused on interconnectedness and integration of wilderness management practices and research (Manning & Lime, 2000).
4. As the proposed WISE management framework develops over time it will become important to integrate the other elements of information and education utilized by wilderness visitors. For example, guidebooks, retail shops and information disseminated in relevant non-government organizations such as The Mountain Club. This recommendation is supported by evidence in the literature which suggests that these are highly influential sources of information that impact wilderness visitor’s choices and behaviours, especially during the planning stage (Manning & Lime, 2000).

4.2 At The National Level

The national level provides unique and equally valuable opportunities to improve and further develop, not only the proposed WISE management framework, but wilderness management in South Africa in general. Direct observation and review of the relevant international and national literature indicate three recommendations that should be addressed.

1. The first recommendation, and most urgent, is that coherent and informative national legislation related to wilderness should be passed. While wilderness has enjoyed legal status in South Africa for more than thirty years, little more than the legal authority to designate wilderness areas has been formally provided or established. As MacDevette (1990) explains “(w)ilderness is however not considered adequately protected unless the area is formally designated in law as a wilderness area and managed to ensure that the wilderness character and integrity of the natural system is retained.” Currently, wilderness can be designated but there is no way to coordinate on a national level what wilderness characteristics and integrity are defined as, or how to ensure that they are retained. As a result, it is recommended that all relevant stakeholders, including EKZN Wildlife, take an active role in formulating the developing national legislation to ensure that wilderness characteristics, values and ways of ensuring their future existence are addressed, in particular the Protected Areas and Biodiversity Bills.
2. It is recommended that efforts be made to coordinate wilderness information and education on a national level. A more wide-spread coordinated effort would lead to a better understanding of wilderness characteristics, values and management practices for the general public (Manning & Lime, 2000). Consequently, furthering the goals of EKZN Wildlife of improving the general public’s understanding of wilderness. The importance of addressing these efforts at the national level for EKZN Wildlife is that not all visitors to the UDP are from the province of KwaZulu-Natal. Thus, to effectively improve wilderness information and education to all visitors to the UDP it would be beneficial to expand the focus of “general public” to include the national audience. Certain organizations, such as the Wilderness Foundation should

play a more authoritative role than a provincial conservation organization in this situation. However, EKZN Wildlife should be conscious and responsible for its role as a motivator and active partner in the processes of coordinating wilderness information and education at the national level.

3. It is recommended that wilderness management and research be coordinated at the national level. In essence, this would constitute the development of a South African Wilderness System. The value of this recommendation is supported by direct observation and the literature (Manning & Lime, 2000). The latter would accomplish two things. Firstly, issues around funding could potentially be better addressed. A South African Wilderness System representing the 466, 330 ha of land designated as wilderness in South Africa (Bainbridge, 2001(a)), as opposed to segmented areas to be considered. This would potentially give wilderness a higher level of importance for consideration in issues of budgeting, grants from international funding organizations and international research programmes. Secondly, efforts to train wilderness managers would be better coordinated and achieve greater consistency of management between the various wilderness areas in South Africa. Consequently, this would reinforce the efforts in recommendation 1 at the national level of improving and coordinating the general understanding of wilderness and its associated values. National level consistency in the management and approach to wilderness would help to convey a clearer message to the general public.

5. Conclusion

The development, field-testing and refinement of the proposed WISE management framework have illustrated three very important points about wilderness information and education programs in the UDP area. The first point is that after thirty years of being designated, the wilderness information and education system is very poorly developed. Secondly, EKZN Wildlife has stated its desire and the need to improve their wilderness information and education efforts, as illustrated in their currently developing wilderness management plans. Thirdly, the international and national literature indicate that formalized management strategies for wilderness information and education are both needed and can be effective when properly informed.

Earlier writings related to this work illustrated the need, rationale and theory behind the development of the proposed WISE management framework within a South African context. This was accomplished by using triangulation of theory, key informants and personal experience in order to be as comprehensive as possible given the constraints of the study. This paper then discussed the results and implications of field-testing the proposed WISE management framework in an effort to refine and improve its applicability for managers. The results clearly indicated the need and feasibility of a systems-wide approach to ensure long-term success for wilderness information and education management strategies in South Africa.

The future of wilderness information and education systems in South Africa is promising for two reasons. The first is that it is the intent, as is supported by field-testing and input from EKZN Wildlife staff, that the results of this study be applicable for wilderness managers in the UDP area immediately upon completion of the study. Secondly, continued evaluation and application will ensure the continual refinement, improvement and adaptability of the proposed WISE management framework to meet the changing needs and challenges of wilderness managers in South Africa.

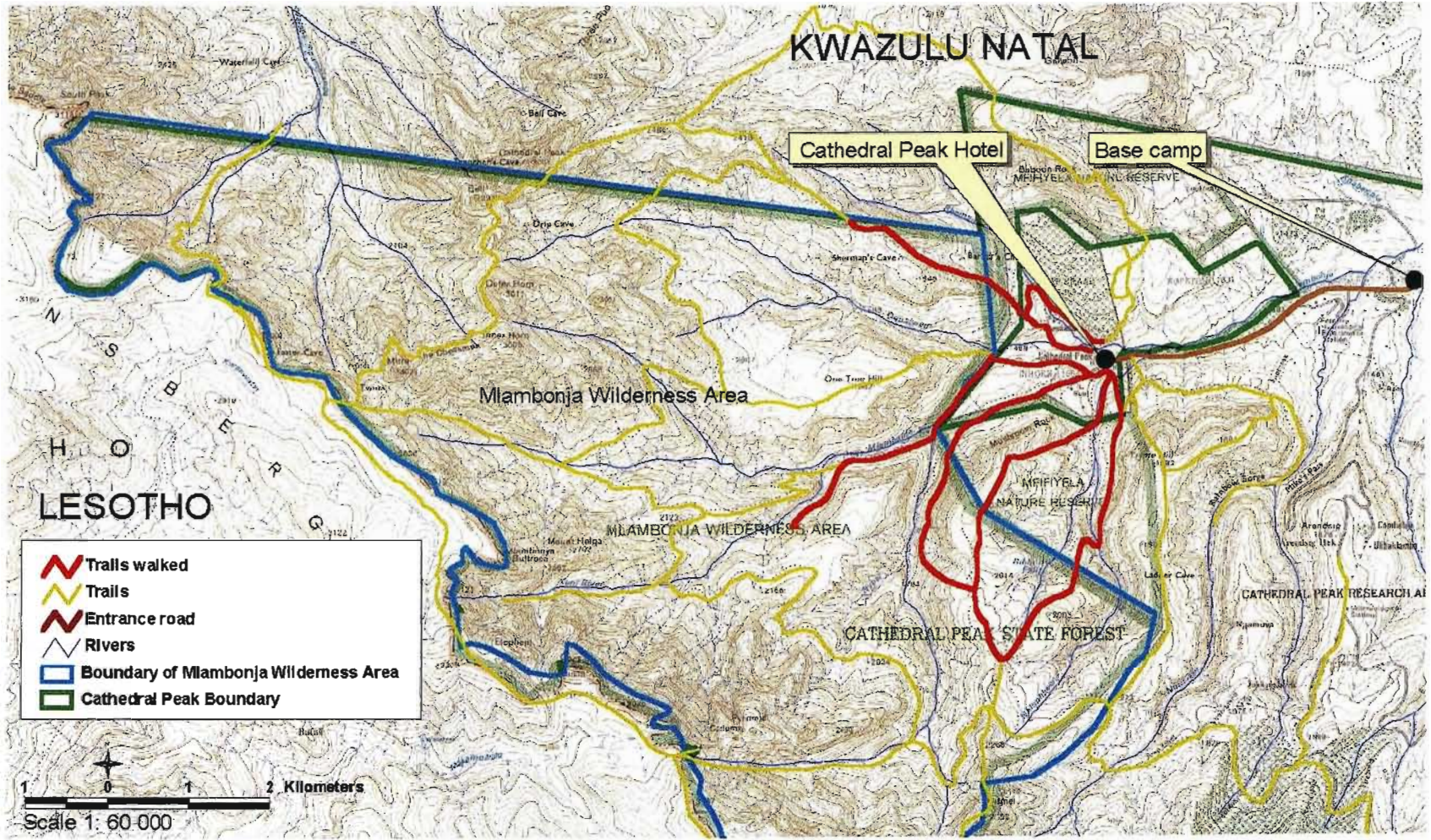
References

- Bainbridge, W. R. 2001 (a). Mountain Wilderness in South Africa. *International Journal of Wilderness*. Vol 7(2): 30-34.
- Buckley, R. 2000. Wilderness in Australia: What's Happening in a World Context. *IN: Proceedings of the Wilderness Science In A Time Of Change Conference*. Missoula, Montana. May 23-27. 1999. USDA Forest Service Proceedings. Vol. 2 p190-193.
- Cessford, G, R. 2000. Identifying Research Needs for Improved Management of Social Impacts in Wilderness Recreation. *IN: Proceedings of the Wilderness Science In A Time Of Change Conference*. Missoula, Montana. May 23-27. 1999. USDA Forest Service Proceedings. Vol. 3 p 231-238.
- Ham, S, H; Krumpe, E, E. 1996. Identifying Audiences and Messages for Nonformal Environmental Education: A theoretical Framework for Interpreters. *Journal of Interpretation Research*. Vol 1(1): 11-23.
- Leung, Y; Marion, J, L. 2000. Recreation Impacts and Management in Wilderness: A State-of-Knowledge Review. *IN: Proceedings of the Wilderness Science In A Time Of Change Conference*. Missoula, Montana. May 23-27. 1999. USDA Forest Service Proceedings. Vol. 5 p 23-48.
- MacDevette, D. R. 1990. Wilderness in South Africa. *Eastern Cape Naturalist*. Pp 22-28.
- Manning, R.E., Lime, D.W. 2000. Defining and Managing the Quality of Wilderness Recreation Experiences. *IN: Proceedings of the Wilderness Science In A Time Of Change Conference*. Missoula, Montana. May 23-27. 1999. USDA Forest Service Proceedings. Vol. 4 p13-52.

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Appendix A



Appendix A
 Map Illustrating Direct Observation
 Field Locations

Appendix B

Appendix B

Refined Set of Criteria

Planning Stage

1. Percentage of wilderness related information on agency website related to knowledge and skills.
2. Percentage of wilderness related information on agency website related to attitudes and behaviours.
3. Percentage of wilderness related information in **printed form** at the agency reservations office related to knowledge and skills.
4. Percentage of wilderness related information in **printed form** at the agency reservations office related to attitudes and behaviours.
5. Percentage of wilderness related information in **audio-visual media form** at the agency reservations office related to knowledge and skills.
6. Percentage of wilderness related information in **audio-visual media form** at the agency reservations office related to attitudes and behaviours.
7. Did asking staff at the reservations office for assistance in finding information related to wilderness increase the number of sources of information you found?
8. Percentage of wilderness related information in **printed form** received in post with reservation information related to knowledge and skills.
9. Percentage of wilderness related information in **printed form** received in post with reservation information related to attitudes and behaviours.

Pre-Trip Stage

1. Percentage of wilderness related information in **printed form** given at the entrance gate related to knowledge and skills.
2. Percentage of wilderness related information in **printed form** given at the entrance gate related to attitudes and behaviours.
3. Percentage of wilderness related information in **printed form** at the visitor centre related to knowledge and skills.
4. Percentage of wilderness related information in **printed form** at the visitor centre related to attitudes and behaviours.

5. Did asking staff at the visitor centre for assistance in finding information related to wilderness increase the number of sources of information you found?
6. Percentage of wilderness related information in **printed form** in the campground related to knowledge and skills.
7. Percentage of wilderness related information in **printed form** in the campground related to attitudes and behaviours.
8. Percentage of wilderness related information in **printed form** in the hatted camp related to knowledge and skills.
9. Percentage of wilderness related information in **printed form** in the hatted camp related to attitudes and behaviours.
10. Percentage of wilderness related information in **printed form** in the curio shop related to knowledge and skills.
11. Percentage of wilderness related information in **printed form** in the curio shop related to attitudes and behaviours.
12. Percentage of wilderness related information in **printed form** in the parking area related to knowledge and skills.
13. Percentage of wilderness related information in **printed form** in the parking area related to attitudes and behaviours.
14. Percentage of wilderness related information in **printed form** in the picnic areas related to knowledge and skills.
15. Percentage of wilderness related information in **printed form** in the picnic areas related to attitudes and behaviours.

Trip-Stage

1. Percentage of wilderness related information in **printed form** given on trailhead signs related to knowledge and skills.
2. Percentage of wilderness related information in **printed form** given on trailhead signs related to attitudes and behaviours.

Post-Trip Stage

1. Percentage of information in **printed form** in the parking area related to visitor feedback on visitor characteristics.
2. Percentage of information in **printed form** in the parking area related to visitor feedback on wilderness related visitor perceptions.
3. Percentage of information in **printed form** in the visitor centre related to visitor feedback on visitor characteristics.
4. Percentage of information in **printed form** in the visitor centre related to visitor feedback on wilderness related visitor perceptions.
5. Percentage of information in **printed form** in the campground related to visitor feedback on visitor characteristics.
6. Percentage of information in **printed form** in the campground related to visitor feedback on wilderness related visitor perceptions.
7. Percentage of information in **printed form** in the huttet camp related to visitor feedback on visitor characteristics.
8. Percentage of information in **printed form** in the huttet camp related to visitor feedback on wilderness related visitor perceptions.

Appendix C

WISE in The Drakensberg



A Guide for Managing Wilderness Information Systems for Education

Produced by Ash E. Shepherd



What is WISE?

Wilderness Information Systems for Education, or WISE, is a management framework that suggests a systematic approach to managing wilderness information and education used for visitor management. It has been developed based on research and field-testing and will continue to develop with your help. WISE is focused primarily on information and education materials produced by EKZN Wildlife for on-site locations. This implies that community and school programmes, as well as information and education programmes done by other organizations are not included.

What does WISE do?

Wilderness managers can use information gained from applying WISE to aid in the planning, development and improvement of on-site wilderness information and education resources, this is done by focusing on three elements of information and education systems. The first element is an understanding of the overall wilderness education experience. This is identified as the WISE framework. The second element is a set of criteria that can be used to evaluate the wilderness information and education system. The third element is a set of guidelines that can be used in the development of individual information and education materials.

How does WISE do this?

By focusing on the three elements of wilderness information and education systems already mentioned, WISE is able to function as an inventory, monitoring and management feedback tool. WISE can be used as an inventory tool in areas where little formal action has been taken to record what information and education materials are present. This is done when the evaluation form is administered and the presence and frequency of wilderness information and education materials is recorded. Once this initial inventory has been done, the WISE criteria evaluation form can be used to monitor changes in the presence and frequency of wilderness information and education materials over time. Lastly, the WISE criteria evaluation form allows an opportunity for feedback to be given from the individuals who administer the WISE criteria evaluation forms. This feedback can then be used to improve the information and education materials as well as the criteria evaluation form itself. This systematic approach helps to ensure that a comprehensive and well thought out education system will continually evolve in order to meet the needs of wilderness managers and the visitors to the wilderness areas.



How To Use The Three Elements Of WISE



WISE Framework

The WISE framework is used to understand the larger picture. It illustrates the overriding processes and role of wilderness information and education as it is used for visitor management for on-site locations. It also provides a foundation for the criteria, which have been selected for use in evaluating the overall system of wilderness information and education. Its primary function is as a foundation and starting point for understanding and administering the other WISE elements.

WISE Guidelines For Developing Information And Education Materials

These guidelines can be used when developing new information and education materials within the wilderness information and education system. They can also serve as a useful guideline for other groups wishing to develop information and education materials related to wilderness or other environmental issues. While it is not the overall intent of the WISE management framework to evaluate individual information and education materials, it is acknowledged that great care needs to be given to their development and revision if they are to be effective. It is conceivable that in the future, as WISE develops and becomes further refined, that these guidelines could be used in order to develop a system of evaluating individual information and education materials.

WISE Criteria Evaluation Form

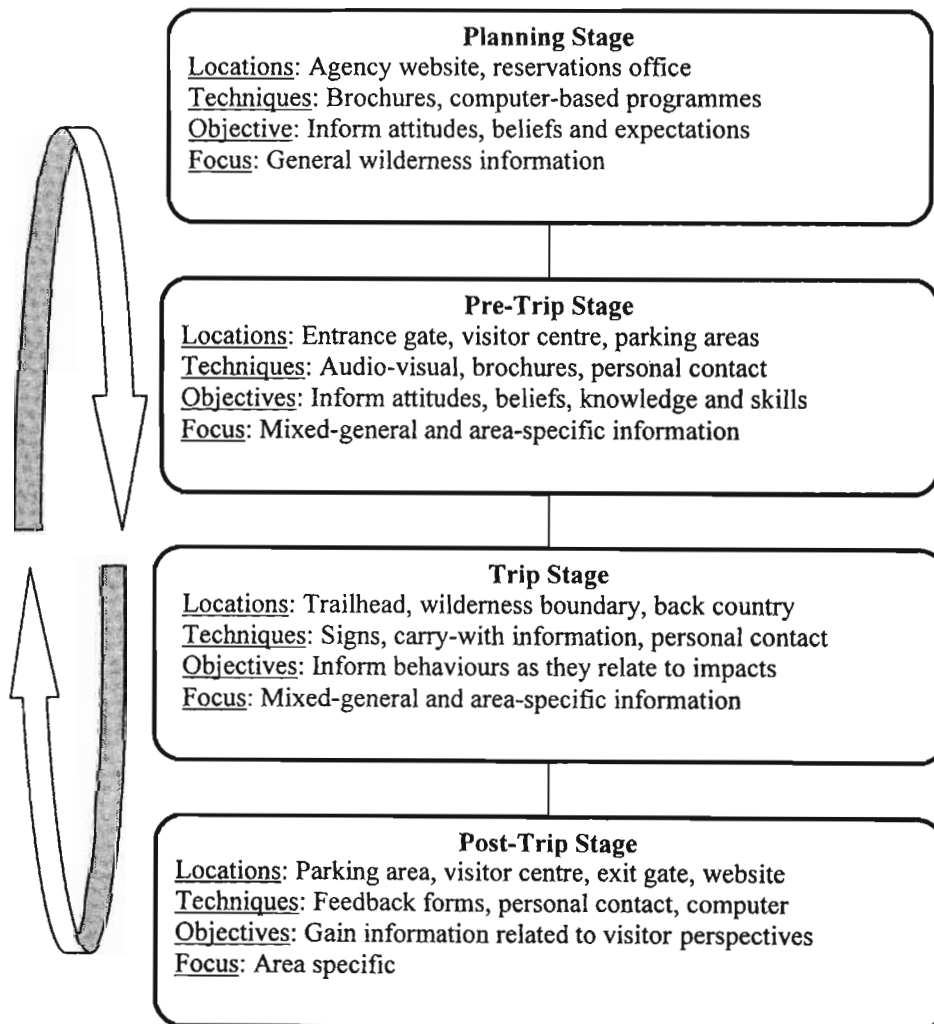
This element of WISE should be used primarily for three things: namely inventorying, monitoring and gaining feedback from administrators of the evaluation form. By administering the WISE criteria evaluation form in areas where no previous inventories of wilderness information and education have been done, it will provide valuable base-line data that wilderness managers can use for present and future studies. When administered in areas where a base-line inventory has already been done it should be used as a tool to monitor management's progress in meeting established wilderness education goals and objectives. Lastly, it should be used as an opportunity for administrators of the evaluation form, generally volunteers and wilderness users themselves, to provide feedback and comments on the various elements of WISE and on the wilderness information and education system itself. More specific instructions on how to administer the WISE criteria evaluation form are included with the form itself.





WISE Framework

The WISE framework briefly illustrates the wilderness education experience. It shows the various stages of the experience and their associated educational techniques, objectives and focus. These elements provide an understanding of how each stage is unique and valuable to the overall goal of wilderness managers and visitors to maintain the wilderness resources while not compromising the unique characteristics of solitude and freedom associated with the wilderness experience. The WISE framework also illustrates some of the reasoning for the development of the WISE criteria used on the evaluation form.





WISE Guidelines For The Development of Individual Education Materials



1. Use of multiple media to deliver a messages is often more effective than the use of a single medium.
2. Information and education programs are generally more effective with visitors who are less experienced and less knowledgeable. Young visitors may be an especially attractive target audience.
3. Brochures, personal messages and audio-visual programs may be more effective than signs.
4. Messages may be more effective when delivered early in the recreations experience, such as during the planning stage.
5. Messages from sources judged as highly credible may be most effective.
6. Computer-based information systems (internet, visitor information computer in visitor centre, etc.) can be an effective means of delivering information and education.
7. Knowledgeable volunteers, outfitters and commercial guides can be effective and efficient in communicating information and education to visitors.
8. Information on the impacts, costs and consequences of problem behaviour can be an effective information and education strategy.
9. Role modelling by park and wilderness rangers and volunteers can be an effective information and education strategy.
10. Personal contact with visitors by rangers and other employees, including before, during, and after the recreation experience, effectively communicates information and education.
11. Messages should be targeted or relevant to specific audiences. Target audiences that might be especially receptive include those that request information in advance (internet, reservation office, etc.) and those who are least knowledgeable.
12. Information and education materials that are attractive are more likely to be noticed and effective.
13. Information and education related to knowledge, skills and attitudes is more likely to impact visitor behaviour than factual information.
14. Information and education techniques that illustrate or demonstrate visitor ownership of wilderness resources and values can be more effective than those that do not.
15. Feedback from visitors can be a valuable tool to develop, refine and improve information and education techniques.

WISE criteria Evaluation Form

The WISE criteria evaluation form should be included with this manual. The WISE evaluation form is included in a separate packet for two reasons. The first is so that once it has been filled out it can be returned to the managing agency easily, together with the feedback form. The second reason the evaluation form is in a separate packet is to allow the rest of the manual to be kept by the administrator of the form as a resource or passed along to other individuals interested in wilderness related information and education programs. Your assistance in implementing WISE in the Drakensberg will help to ensure that the understanding and management of the wilderness resources and values of the area will continue to improve.

Any questions or comments about WISE in the Drakensberg or other wilderness education related issues should be directed to

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Instructions

In order to aid you in the administration of the WISE criteria evaluation form you have been provided with two items. The first item is a set of definitions that should clearly explain elements that are to be evaluated. The second item is a brief explanation as to how the various elements on the form should be used.

Definitions

- **Agency website**-The website administered by EKZN Wildlife (www.rhino.org.za)
- **Printed form**-This refers to materials that are either for display or can be taken by the visitor. Examples include brochures, maps, pamphlets, posters, etc
- **Audio-visual media form**-This refers to materials that are for display, can be taken by the visitor or is orally presented. Examples include, video/movie presentations, dioramas, interpretive talks, etc.
- **Agency reservation office**-This refers to the reservations office located at Queen Elizabeth Park (QEP).
- **Post with reservation information**-This refers to the materials that a wilderness visitor would receive in the post after making a reservation via the telephone, email or post.
- **Entrance gate**-This is the gate at which you officially enter onto land managed by EKZN Wildlife. It is the point at which you usually pay your entrance fee.
- **Visitor centre**-This refers to both reception offices and visitor centres. This is generally the location where a visitor could make a reservation and or fills out the mountain registrar and is located within a park or reserve.
- **Campground**-This is the location where visitors provide their own lodging in the form of a tent or trailer.
- **Hutted camp**-This refers to the areas where visitors stay in lodging provided by EKZN Wildlife such as huts, chalets or a lodge.
- **Curio shop**- This refers to a retail shop generally located within the hutted camps or near the reception area that sell a wide range of items.
- **Parking area**-This refers to the immediate vicinity of where a day and or overnight wilderness visitor would park their vehicle.
- **Trailhead**-An area located a short distance in from where the visitor leaves a road or parking area and begins walking on a footpath.

Name _____ Wilderness _____

Date ___ / ___ / ___

Trip Stage

1. Percentage of wilderness related information in **printed form** given on trailhead signs related to knowledge and skills.

High Med Low Very Low None

Number of wilderness information sources 0 1 2 3 4 5+

Number of total information sources 0 1 2 3 4 5+

Overall focus of information is (please circle) **General / Area Specific / Mixed**

Comments _____

2. Percentage of wilderness related information in **printed form** given on trailhead signs related to attitudes and behaviours.

High Med Low Very Low None

Number of wilderness information sources 0 1 2 3 4 5+

Number of total information sources 0 1 2 3 4 5+

Overall focus of information is (please circle) **General / Area Specific / Mixed**

Comments _____

High= Approximately All, Med = Approximately 3/4, Low = Approximately 1/2,
Very Low = Approximately 1/4, None = No Wilderness Information Present

Name _____ Wilderness _____

Date ___/___/___

Post-Trip Stage

1. Percentage of information in **printed form** in the parking area related to visitor feedback on visitor characteristics.

High Med Low Very Low None

Number of total information sources
 0 1 2 3 4 5+

Comments _____

-
2. Percentage of information in **printed form** in the parking area related to visitor feedback on wilderness related visitor perceptions.

High Med Low Very Low None

Number of total information sources
 0 1 2 3 4 5+

Comments _____

-
3. Percentage of information in **printed form** in the visitor centre related to visitor feedback on visitor characteristics.

High Med Low Very Low None

Number of total information sources
 0 1 2 3 4 5+

Comments _____

High= Approximately All, Med = Approximately 3/4, Low = Approximately 1/2,
Very Low = Approximately 1/4, None = No Wilderness Information Present

Name _____ Wilderness _____

Date ___ / ___ / ___

Post-Trip Stage

4. Percentage of information in **printed form** in the visitor centre related to visitor feedback on wilderness related visitor perceptions.

High Med Low Very Low None

Number of total information sources
0 1 2 3 4 5+

Comments _____

-
5. Percentage of information in **printed form** in the campground related to visitor feedback on visitor characteristics.

High Med Low Very Low None

Number of total information sources
0 1 2 3 4 5+

Comments _____

-
6. Percentage of information in **printed form** in the campground related to visitor feedback on wilderness related visitor perceptions.

High Med Low Very Low None

Number of total information sources
0 1 2 3 4 5+

Comments _____

High= Approximately All, Med = Approximately 3/4, Low = Approximately 1/2,
Very Low = Approximately 1/4, None = No Wilderness Information Present

Name _____ Wilderness _____

Date ___/___/___

Post-Trip Stage

7. Percentage of information in **printed form** in the hutted camp related to visitor feedback on visitor characteristics.

High Med Low Very Low None

Number of total information sources 0 1 2 3 4 5+

Comments _____

8. Percentage of information in **printed form** in the hutted camp related to visitor feedback on wilderness related visitor perceptions.

High Med Low Very Low None

Number of total information sources 0 1 2 3 4 5+

Comments _____

High= Approximately All, Med = Approximately 3/4, Low = Approximately 1/2,
Very Low = Approximately 1/4, None = No Wilderness Information Present

WISE Feedback Form

Name (optional): _____

Date: _____

Location Criteria Evaluation Form Administered: _____

Group Affiliation (optional): _____

Please mark the choice that best describes the level to which you agree with each statement. Use the comment section to add any additional comments or input you feel would be helpful in improving each specific element of WISE in the Drakensberg. Thank you for your time and assistance.

To be filled out upon completion of the WISE criteria evaluation form

1) The instructions for administering the evaluation sheet were easy to understand.

Strongly Agree Agree Undecided Disagree Strongly Disagree

Comments _____

2) The criteria used on the evaluation form were representative of all the on-site information and education elements the managing agency should be monitoring.

Strongly Agree Agree Undecided Disagree Strongly Disagree

Comments _____

3) The WISE in the Drakensberg user manual clearly explains what the WISE management framework is used for.

Strongly Agree Agree Undecided Disagree Strongly Disagree

Comments _____

4) The WISE in the Drakensberg user manual provides useful information beyond understanding how to administer the WISE criteria evaluation form.

Strongly Agree Agree Undecided Disagree Strongly Disagree

Comments _____

5) The EKZN Wildlife staff were very helpful in assisting with efforts to administer the WISE criteria evaluation form.

Strongly Agree Agree Undecided Disagree Strongly Disagree

Comments _____

Please feel free to add any additional comments about WISE in the Drakensberg that you feel may be helpful to the staff of EKZN Wildlife. Thank you again for your time and assistance.

Please Return the Evaluation and Feedback Forms to:
Insert Appropriate Information