

**THE IMPLEMENTATION OF**  
**AN ENVIRONMENTAL MONITORING AND MANAGEMENT SYSTEM**  
**IN THE WILDERNESS AREA OF THE HLUHLUWE-IMFOLOZI PARK**

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As the candidate's Supervisor I agree/do not agree to the submission of this dissertation.

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## **ABSTRACT**

KwaZulu-Natal's Hluhluwe-Imfolozi Park has historically been prioritized for biodiversity conservation but it also has the oldest protected wilderness area in the country. For 50 years, conservation management, tourism and education within the Imfolozi Wilderness Area have generally been carried out using non-mechanized wilderness principles. The validity of the Imfolozi Wilderness is constantly questioned in terms of efficiency, equity and aesthetics and is consequently subject to a variety of pressures that those different ideologies can exert. The historical development and applicability of the wilderness concept is examined here against evolving South African social and environmental circumstances. Whilst this investigation confirms the findings that colonialism and apartheid resulted in the exclusion of local peoples from protected areas, it also takes note that Imfolozi's history is characterized by organizations and individuals who ignored the racist laws of the time. Nevertheless, management structures pertaining to both politics and conservation tended to be top-down, such that the Imfolozi Wilderness retained an air of elitism, regardless of attempts to be racially inclusive. Modern trends in protected area management expose the necessity of refining the justification of wilderness areas, to simultaneously recognize localized priorities and the importance of such areas to the planet's ecological wellbeing. Without attempting to resolve philosophical debates but, at the same time, recognizing their validity, protected area management requirements for the Imfolozi Wilderness are examined in terms of the legal mandate handed to the management agency. This leads to the selection of the *Limits of Acceptable Change* planning and management system which is implemented as an action research project in conjunction with the Imfolozi Management Team, over a three year period. This involved: defining legal mandates and area issues; defining the zonation categories for the wilderness area; selecting the indicators to measure human impact; compiling an inventory of conditions in the wilderness area; specifying standards; examining alternative zonation category allocations from stakeholders and selecting a preferred alternative. The desired outcome was the establishment of a system in which managers could receive ongoing collaboration from stakeholders and consultatively develop a defensible wilderness management strategy that would meet the legal requirements of the area's proclamation. Through a descriptive narrative, this dissertation provides an account of the implementation process and discusses to what extent this has been achieved.

## **DECLARATION**

I, Paul Bernard Cryer, declare that

- (i) The research reported in this dissertation, except where otherwise indicated, is my original work.
- (ii) This dissertation has not been submitted for any degree or examination at any other university.
- (iii) This dissertation does not contain other persons' data, pictures, graphs or other information, unless specifically acknowledged as being sourced from other researchers.
- (iv) This dissertation does not contain other persons' writing, unless specifically acknowledged as being sourced from other researchers. Where other written sources have been quoted, then:
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Signed:

Date

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Paul Bernard Cryer

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Lastly, I thank the wilderness area of Imfolozi itself, including all of its plant and animal inhabitants - for allowing me to become one of them.

### **AUTHOR'S NOTE**

The background and motivation for this work are covered within the introduction and literature review but what is not explained is how I came to be involved and, for that, some personal history is necessary. In 1991 I fulfilled a childhood dream of working in a game reserve when I became a trails officer for the Wilderness Leadership School which involved leading 5 to 15-day educational hikes, primarily in the wilderness areas of Imfolozi, but also iSimanagalisio and the uKhahlamba Drakensberg Park. At that time, the guiding of such trails was almost completely unregulated so that I was afforded incredible freedom to explore those areas as I worked. Those years (fifteen of them) had a significant effect on my thinking and personal development.

Within that period, from 1996, the management authority invited me to sit on the Wilderness Area Steering Committee for the park and it was that body that originally initiated this work. It soon became apparent that this project required full time attention and the members of the Steering Committee were eager for that work to be carried out by someone who was familiar with the land. There is a paradox here: at that time, in about 2004, I was starting to feel restricted by the regulations that were becoming an imposition to wilderness guides. I thought that the use of cell phones, GPSs and tick-box accreditation systems should be the burden of future

generations of wilderness guides rather than mine. Consequently, I made myself available to conduct a research project to implement a monitoring and management system that could effectively regulate - and “trammel” - the wilderness area of Imfolozi or the experience of it. The awareness of that contradiction softened my approach to the task.

Two other personal aspects are pertinent. Firstly, I did not approach this project with cold neutrality and objectivity: I started it because I wanted to protect an area with which I had developed a deep connection. I was aware of the danger of those sentiments and had to take steps to ensure, through regular consultation and self examination, that the functional credibility of the work was not being compromised by personal intentions. As I progressed with the research, I began to ask myself questions like, “From whom or what is the wilderness area to be protected?”, or “For whom or what is the wilderness area to be protected?” As one would expect after a three year research process, my thinking and views have shifted considerably. This project has been like many other life-changing ventures, where the reason for initiating it and the reason for perpetuating turn out to be very different.

Secondly, the people who were actually involved with the work on the ground in Imfolozi are a tight-knit community. So when I refer to meetings with Section Rangers and Conservation Managers I am, in reality, speaking of close friends that I have known for most of my working life. This provided a climate of co-operation that may not be properly articulated in the pages that follow.

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## **LIST OF ABBREVIATIONS**

HiP – Hluhluwe-Imfolozi Park  
IMP – Integrated Management Plan  
IUCN – International Union for the Conservation of Nature  
LAC – Limits of Acceptable Change  
LNT – Leave No Trace  
NEMA – National Environmental Management Act (No. 107 of 1998)  
NEMBA – National Environmental Management: Biodiversity Act (No. 10 of 2004)  
NEMPAA – National Environmental Management: Protected Areas Act (No. 57 of 2003)  
NGO - Non-governmental organization  
NOLS – National Outdoor Leadership School  
PMA – Peripheral Management Area  
TPC – Thresholds of Potential Concern  
US – United States (of America)  
VAMP – Visitor Activity Management Processes  
VERP – Visitor Experience and Resource Protection  
VIM – Visitor Impact Management  
WF – Wilderness  
WIMS – Wilderness Inventory and Monitoring System  
WLS – Wilderness Leadership School  
WMA – Wilderness Management Area

## **TERMINOLOGY**

The difficulty with a field of interest that spans decades and continents is that the language used to describe it is neither static nor consistent. The spelling variations for the park in this study include *Umvolosi*, *Umfolozi*, *iMfolozi*, *Imfolozi*, *eMfolozi* and *Mfolozi*. This project makes use of the isiZulu spelling *iMfolozi*, in keeping with the current practice of the management authority,

but with the first letter capitalized, in keeping with the conventions of English grammar. Many of the supporting documents or references use alternative or historic spellings.

The provincial authority for the Hluhluwe-Imfolozi Park is the KwaZulu-Natal Nature Conservation Board and the implementing agency created by that board is the KwaZulu-Natal Nature Conservation Service, an amalgamation of two provincial bodies: the Natal Parks Board (NPB) and the KwaZulu Directorate of Nature Conservation (KDNC and previously the Bureau of Natural Resources). The KwaZulu-Natal Nature Conservation Service is more commonly referred to as Ezemvelo KZN Wildlife. Many supporting documents make reference to EKZN Wildlife or EKZNW. This work uses the name Ezemvelo KZN Wildlife except when quoting verbatim or referring to the historic institutions.

The term *Zululand* is used to refer to the historic political boundary, that part of the KwaZulu-Natal Province north of the Tugela River. It is also used by Ezemvelo KZN Wildlife as one of the three managerial regions that make up the province, the other two being *uKhahlamba* and *Coast*. The Hluhluwe-Imfolozi Park is in the Zululand Region.

The use of the word *trail* in the United States of America (US) refers specifically to a path but its usage in South Africa (and this work) also includes a hike; so a wilderness trail is a hike one could undertake in a wilderness area. Ezemvelo KZN Wildlife's marketing department refers to trails that make use of fixed camps as *conventional trails* and by contrast, backpacking trails where all equipment is carried by the participants are referred to as *primitive trails*. This can cause considerable confusion when the term *primitive* is used to describe zonation categories as well.

Some management/planning processes in the US avoid the controversy of classifying different zoning categories within wilderness areas by using the term *opportunity class* instead of *zone*. Whilst this work was being researched and implemented, every attempt was made to utilize similar terminology to that used in the US but in some cases this did not work. South African management practice openly refers to zonation and attempts to use alternative terminology only caused unnecessary confusion. Consequently, the terms *zones* and *zonation* are used throughout this work.



The term *management team* of a park ordinarily refers to its manager and Section Rangers. For the purpose of this dissertation, the term *project management team* refers to the core group that implemented or contributed to this project, made up of the Conservation Manager, the three Imfolozi Section Rangers and the author.

The term *social*, when used in connection with indicators of human impact, refer to those impacts that affect the human perception of wilderness. *Resource indicators* of human impact are those that affect the nature of the area itself.

## **STRUCTURE**

This work is made up of five chapters. The *introduction* (Chapter 1) focuses on the motivation for the study and the area where it took place. The *literature review* (Chapter 2) of this action research project had to provide background to the practical implementation that follows, so the study moves from a theoretical investigation of wilderness and its management to the legal requirements that determine how it can be managed. The literature review concludes with the selection of a management approach. The *method* (Chapter 3) provides an explanation of that approach as an action research project and goes on to provide an account of the implementation process. The *results and discussion* (Chapter 4) present the outcomes of the selected management process and reveal strengths and weaknesses that were experienced during implementation. Finally, Chapter 5, *future directions, recommendations and conclusions*, points to how the system can be improved in the Hluhluwe-Imfolozi Park and concludes with what the project has accomplished.

As an action research project, this work was researched and applied to management practice simultaneously and it should be noted from the outset that this has necessitated certain inconsistencies within the structure of the dissertation. These inconsistencies manifest themselves in two ways:

- Particular occurrences within the implementation process receive accentuated attention within the dissertation. For example certain meetings of the project management team are described with more detail than the rest of the implementation process because they significantly altered the direction of the research. Similarly, the descriptions of monitoring and management issues pertaining to both wilderness trails and rhino capture receive added emphasis because of the potential magnitude of the impacts associated with those activities.
- The sequential nature of the project's implementation process has meant that that certain conclusions had to be drawn at the end of each step, before commencing with the next one. So whilst methods, results and conclusions are largely represented in three different chapters, there is a degree of discussion that takes place in each of those chapters which have been written as an inter-linked narrative.

**THE IMPLEMENTATION OF AN ENVIRONMENTAL MONITORING AND  
MANAGEMENT SYSTEM IN THE WILDERNESS AREA OF THE HLUHLUWE-  
IMFOLOZI PARK**

**CHAPTER 1 – INTRODUCTION**

**1.1 – AIM**

The aim of this work has been the implementation of a collaboratively established management system that enables the monitoring and mitigation of human influences on the wilderness area of the Hluhluwe-Imfolozi Park. From the outset it must be stated that this project addresses the issues associated with wilderness at a time when human values are shifting and being pulled by a multitude of forces in a number of directions. The dynamic nature of the project's social context meant that previously held assumptions needed to be re-tested, not least of which is the existence and relevance of wilderness itself. Another historic debate that has relevance in this dissertation is the validity of wilderness management: is it an oxymoron? Does its implementation erode the very entity it is aiming to protect? What is its purpose? When ecological theory favoured the notion of ecosystems moving towards, and ultimately attaining, a relatively stable and climactic condition, the naturalness of an area and its wildness were effectively the same thing (Allaby, 2005). Because such places were thought to be in self-regulating balance, any intervention would have a negative effect on that balance (Botkin, 2000). Increasingly, however, ecosystems have been viewed as dynamic entities that are constantly shifting in response to ever-changing internal and external circumstances. Consequently, leaving a place to be wild or unregulated could result in its naturalness being threatened because that wildness is not going to steer the area automatically towards the promised land of climactic wilderness. The shift in ecological thinking away from climactic stability has resulted in wildness and naturalness being viewed as separate entities and with that separateness come implications and more questions: does the designation of wilderness imply the preservation of ecological integrity, opportunities for solitude or unregulated access? In other words, should wilderness areas be managed for naturalness or

wildness? The answer in almost all cases would be – different amounts of both. But the validity of the question means that the term *wilderness management* is no longer an oxymoron because there will always be a management emphasis (Botkin, 2000). Once this has been established, other questions emerge: who should decide on the management emphasis for wilderness areas and what restrictions should be placed on the type or nature of management interventions? The first part of that question is scrutinized in Section 2.2 of the literature review. The second part of the question makes up the bulk of the methods chapter (Chapter 3) where the theoretical and philosophical issues raised in the literature review are applied to operational practice.

Two principles emerged and became reinforced throughout the study: firstly, that the intention to include this research within the park's provincially ratified management plan automatically brought the process into the political arena, to confirm the observation of Beinart and Coates (1995) that *wildness* is a physical or philosophical entity but *wilderness* is a designation created in legislation. A broader view of wilderness conservation shows it to be a more complicated pursuit than protected area managers initially envisaged and one that resides within the field of social science. In no small degree this is a product of South Africa's protected area history. The South African National Parks system has successfully survived the traverse from an ideology of racist white nationalism to one encompassing African nationalist heritage, with previously ostracized local communities contributing to the management and ownership of protected areas (Cock, 1998). The Zululand wilderness story has an Anglo/Zulu nationalist origin characterized by communications between the ruling elite (Draper, 1998). The political changes in the 1990s, combined with the evolving principles of sustainable development and protected area management, have precipitated a philosophical revision whereby natural resources are managed in a more equitable and participatory fashion.

Secondly, participatory and collaborative management systems require time for trusting relationships to mature. This project represents a commitment on the part of the management authority to follow that path, and not a completed journey.

## **1.2 - THE MOTIVATION FOR THE WORK**

This dissertation is driven by five features

1. Currently the Imfolozi Wilderness Area, the oldest in Africa, is only protected by a board resolution of the managing authority, the KwaZulu-Natal Nature Conservation Board.
2. Revision of the current management plan for the area is a functional and legal necessity in terms of the National Environmental Management: Protected Areas Act (2003). The need for a specific management system for the wilderness area has been articulated by the management authority.
3. In order for the area to retain its classification as wilderness, levels of human interference need to be monitored and, where necessary, mitigated.
4. The justifications and objectives for the wilderness area are not consistent. In some instances, the views of different user groups are in direct conflict. Any management plan must reflect those differences and resultant management interventions must be collaboratively implemented.
5. For the wilderness area to be successful, as both an ecological and political entity, it must have the involvement and support of the community. The scarcity of wilderness and its importance, from the perspective of biodiversity, mean that community involvement would include local, provincial, national and international components.

## **1.3 – THE RESEARCH PROBLEM**

This dissertation is primarily an account of the application and implementation of a wilderness management system. There are, however, three issues which define the research problem and determine the consequent research objectives.

1. Systems to manage wilderness areas have been mentioned and referenced within the management structures of the Imfolozi Wilderness Area (Ezemvelo KZN Wildlife, 2000) but have never been formally and comprehensively applied. Whilst there could be a number of reasons for this (lack of institutional support, rapid staff turn-over, managers

not wishing to have their own actions limited and/or decision-making paralysis because of conflicting management objectives) it was important to comprehend that aspects of an applied monitoring and management system could meet with resistance from the very management authority that was sanctioning the work.

2. Many wilderness management systems focus on the issue of recreational impact (Leung and Marion, 2000). Whilst those are pertinent to the Imfolozi Wilderness Area, some of the most significant human impacts are as a result of management practices. The applicability of wilderness management systems, on management practices, has been highlighted as an area requiring further research (Merigliano *et al*, 1998). Can a management system be implemented that applies to the monitoring and management of the management activities themselves?
3. It was going to be problematic to isolate human induced impact in an area where mega-herbivores inflict impacts of similar appearance. The indicators, to be selected, must result in monitoring information that differentiates between human and other impact.

#### **1.4 - OBJECTIVES**

The objectives emanating from the research problems can be listed as follows:

1. Find a means of implementing a wilderness monitoring and management system that would reduce institutional, managerial and stakeholder resistance. To stress this, it is the means of implementation that requires research and not merely ascertaining what type of management system is appropriate for the wilderness area of Imfolozi.
2. Develop or extend an existing monitoring and management system that simultaneously applies to management activities as well as recreational impacts.
3. Develop a set of indicators for human impact that is not rendered ineffective by mega-herbivores or fire management practices.

These objectives were developed in conjunction with the members of the Imfolozi management team who were eager for the account of the implementation process to be a useful management

tool in itself. This desire has affected the presentation of the dissertation which is intended to be more broadly accessible.

### 1.5 - **AREA DESCRIPTION**

The Imfolozi Wilderness Area, the oldest protected wilderness area in South Africa (Geddes Page, 1979) is situated in the south eastern portion of the 89 000 hectare Hluhluwe-Imfolozi Park (28°23'00"S, 31°52'00"E), some 250 km north of Durban in KwaZulu-Natal. The park first gained legal protection in 1897 following the discovery of white rhinoceros (*Ceratotherium simum*), which were thought to have been shot to extinction. The area was de-proclaimed for a period in the 1940s for tsetse fly "eradication" (Foster, 1955). In the 1950s the park was expanded and the fencing of it commenced. The fencing included the "crown lands" of the corridor, which links Imfolozi and Hluhluwe (Foster, 1955). In 1957 the wilderness area was demarcated as the area between the Black and White Imfolozi Rivers. It has increased in size from 12 150 hectares to about 32 000 hectares between 1959 and 2002 (Geddes Page, 1979 and Ezemvelo KZN Wildlife, 2002). This meant that permanent structures such as roads and buildings were disallowed and management activities were restricted to those that could be carried out on foot, canoe or horseback. In September 1995 the Wilderness Area Management Plan was introduced to focus on management policies specific to wilderness (Ezemvelo KZN Wildlife, 2000). Prior to this, the management of the wilderness area was covered in the park's overall planning process without significant provisions being made for its wilderness character, nor stipulating specific wilderness management practices (Densham and Conway, 2003).

The Wilderness Area Management Plan made provision for a steering committee (established in 1996) to oversee policy and stipulated that human activities in the wilderness area should be monitored and audited annually. This commenced in 1997 with thirteen wilderness audits completed to date; the efficacy of these is discussed in the methodology in point 3.8.1.

The Wilderness Area Steering Committee is an advisory body with no actual authority or accountability. Authority sits with Ezemvelo KZN Wildlife, a parastatal body, receiving funds from provincial government supplemented by income generated through tourism and fundraising. Within

Ezemvelo KZN Wildlife, tourism is controlled by Commercial Services and research falls under the Ecological Advice Division. From a land management perspective the Hluhluwe-Imfolozi Park has two conservation managers, one responsible for Hluhluwe and the other for Imfolozi. The Imfolozi Conservation Manager has three Section Rangers whose combined areas account for the whole of Imfolozi and part of the corridor. Each Section Ranger would be responsible for between ten and twenty Field Rangers, as well as a body of general assistants and labourers employed on both a full-time and temporary basis. Two of the three Section Ranger Outposts are on the boundary of the wilderness area and in addition to these there are four Field Ranger Camps on or near the wilderness area boundary.

The public has access to the area through the educationally-oriented system of guided wilderness trails offered by both Ezemvelo KZN Wildlife and the Wilderness Leadership School (WLS), a non-profit NGO (Ezemvelo KZN Wildlife, 2000). Sponsored and paying trails are offered by both Ezemvelo KZN Wildlife and the WLS.

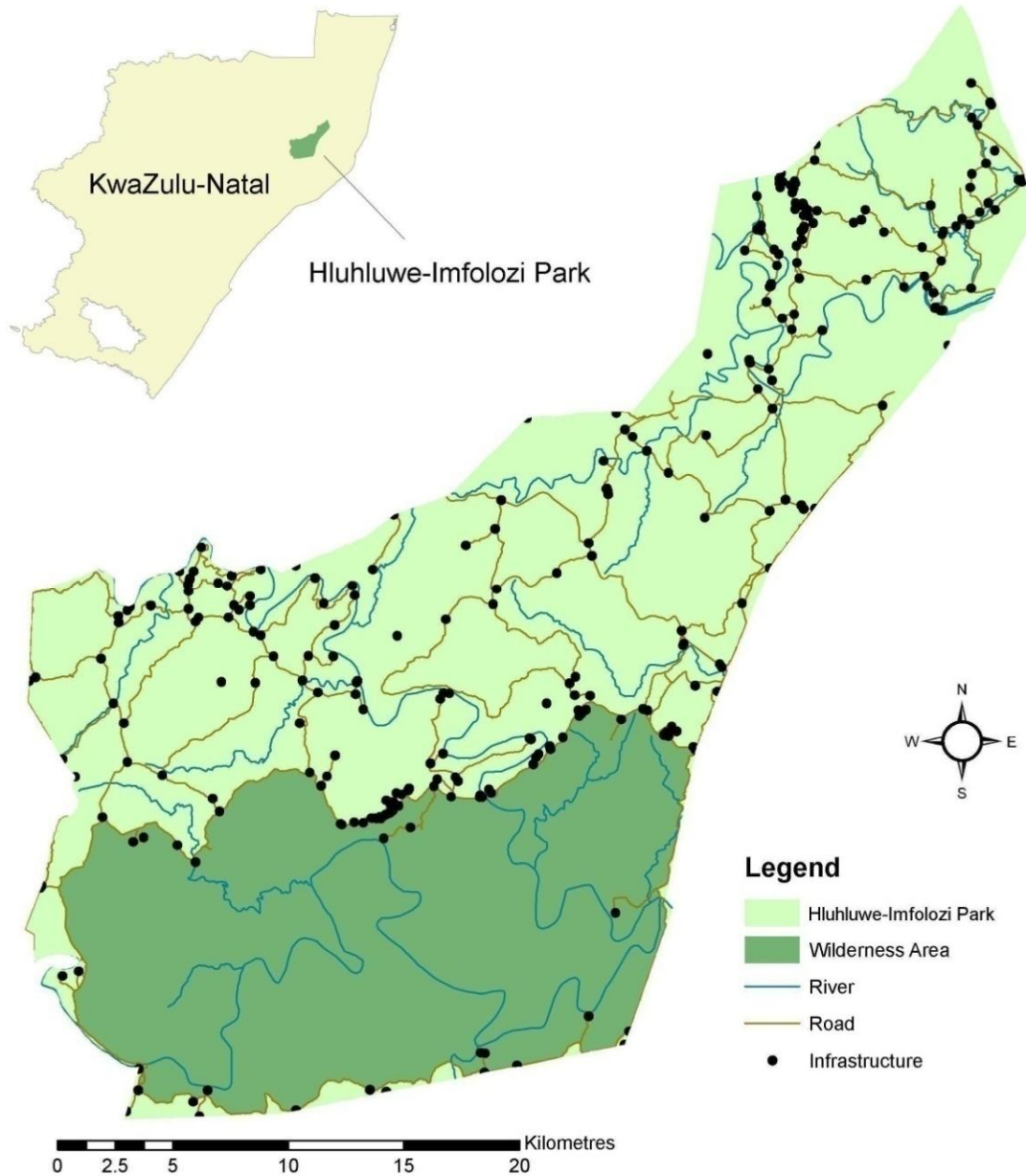
The wilderness area's southern and eastern boundary is a management track next to the parks boundary fence. The western boundary is a management track that feeds into a tourist road that heads northwest, past Mpila Camp, the Masinda Outpost and the Centenary Centre to Mambeni Gate in the east (see figure 1).

There are two major rivers flowing through the wilderness area: the Black Imfolozi in the north and the White Imfolozi in the south. These two rivers converge on the eastern boundary at Siyambeni (see figure 1). A number of sporadically productive tributaries feed into these rivers and there are a few perennial springs. A clay layer provides for the retention of the summer rainfall in pans.

Geologically, Dwyka and Ecca formations overlay Natal Group Sandstones respectively. Periodic tilting of the continent resulted in elevated and undulating landscape. Summer rainfall (October – March) decreases from east (mean annual average of 900mm) to west (mean annual average of 600mm) and maximum annual temperatures vary between 13° and 35° C. These conditions have resulted in a wide range of soil types with shallow stony soils on the high lands and rich deep soils lower down. As a result of the climate and geomorphology, the area falls within the Savanna Biome (Low and Rebelo, 1996 and Ezemvelo KZN Wildlife, 2002).



The Hluhluwe-Imfolozi Park as a whole is important to the biodiversity of the region and the wilderness area, as part of that whole, plays a critical role. An abundance of impala (*Aepyceros melampus*), nyala (*Tragelaphus angasii*), kudu (*Tragelaphus strepsiceros*), buffalo (*syncerus caffer*), zebra (*Equus burchelli*), waterbuck (*Kobus ellipsiprymnus*) and wildebeest (*Connochaetes taurinus*), as well as a host of less common herbivores, provide a food base for a broad range of predators. These include: lion (*Panthera leo*), leopard (*Panthera pardus*), spotted hyaena (*Crocuta crocuta*), cheetah (*Acinonyx jubatus*) and wild dog (*Lycaon pictus*). Of its mega-herbivores, the park must be most famous for the role it played in increasing the numbers of white rhino and it is now contributing towards black rhino (*Diceros bicornis*) conservation. The re-introduction of the elephant (*Loxodonta Africana*) commenced in the 1980s and there have been periodic introductions of hippopotamus (*Hippopotamus amphibius*). The area offers sanctuary to a wide range of avifauna, including vultures and Ground Hornbills (*Bucorvus leadbeateri*). The 26 species of fish are under constant threat because of damaged catchments outside the protected area. There are 26 recorded species of amphibians and 59 species of reptiles (Ezemvelo KZN Wildlife, 2002).



**Figure 1: Map of the Hluhluwe-Imfolozi Park, indicating the position of the wilderness area (dark green). The term *Infrastructure* in the legend refers to all permanent human made structures including buildings, pump houses, water tanks and bridges.**

## **1.6 – PERTINENT CHARACTERISTICS OF THE IMFOLOZI WILDERNESS**

The following characteristics of the Imfolozi Wilderness area are relevant to this study:

1. The classification of the southern part of Imfolozi as a wilderness area has no legal standing at either a provincial or national level. It is currently protected by the resolutions of the KwaZulu-Natal Nature Conservation Board. It is described in the current Wilderness Area Management Plan as reflecting the management purposes of the IUCN Category 1b.
2. The area has had a long history of human activity (Foster, 1955). This includes habitation (Nguni homesteads from as recent as 70 years ago, iron ore smelting sites, San paintings and Stone Age tools from tens of thousands of years ago), war, hunting, ongoing culling with two major culls in the 1940s and 1980s, the spraying of DDT, the alteration of river systems, the introduction of foreign diseases, alien plants, roads, buildings and an aeroplane crash (Ezemvelo KZN Wildlife, 2000). Combine these with the wilderness area's relatively small size and the fact that it is situated on the periphery of its protected area, then it is surprising that it has a wilderness character at all! But from a perceptual perspective, a sense of wildness predominates there (Player, 1987). From an ecological perspective, the natural interactions between the various components of the ecosystem, biotic and abiotic, play a significant role in shaping the nature of the area (Ezemvelo KZN Wildlife, 2000).
3. In spite of park management adhering to wilderness management principles, the wilderness area currently receives a considerable amount of human traffic. This includes patrols, guided wilderness trails, research activities and, periodically, game capture and alien plant eradication. The presence of humans is itself an impact (Densham and Conway, 2003).
4. Pollution impacts upon the human perception of wildness; this would include visual, air or noise pollution, as well as physical and chemical damage to both land and rivers from outside the wilderness area.

## **CHAPTER 2 – LITERATURE REVIEW**

### **2.1 – WILDERNESS PHILOSOPHY: ITS DEVELOPMENT AND APPLICATION**

#### **2.1.1 – Historical Context**

Is the concept of wilderness relevant in South Africa today? To answer that, the evolution of the wilderness concept requires scrutiny. The idea of environmental protection pre-supposes its value and finite quality. The value of the environment, in a society committed to development, is often based on the efficient exploitation of resources, while social justice issues may dictate equity as a priority in the division of those resources. Aesthetic motives for environmental protection, whilst being anthropocentrically based (protecting beautiful nature for future generations of people), point towards an ecological paradigm whereby ultimately the intrinsic values and even rights of nature are recognized. The efficient, equitable and/or aesthetic motives for conservation may be seen as an historical continuum (Koppes, 1988), and all acts of environmental protection, including wilderness protection, can be justified, with varying success, against each of those motives.

The 20<sup>th</sup> Century environmental protagonist David Brower reportedly said, “Wilderness is the crucible of evolution. Only in the lasting fraction of a geological tick of time has man sailed out on the uncertain seas of controlling what once controlled him” (Nash, 1982, Pg 258).

Historic references of aboriginal peoples indicate that the connection between humanity and nature was to a great extent intact (McLuhan, 1972). From the time of Neolithic villages, philosophical shifts took place, which relegated the environment to a resource (Swimme and Berry, 1992). Only in the last few decades have accounts of the modern world’s evolution included, with pathos, humanity’s self-imposed disconnection with the natural world (Swimme and Berry, 1992). Descartes’ assertion, that the physical world and the mind are fundamentally separate, resulted in the subjugation of the “mindless”. Minor extrapolations of this idea entrenched humanity’s supremacy over the rest of the planet and confirmed the Judeo-Christian premise that the non-human realm, lacking soul, could be manipulated without consequence or ill conscience (Swimme & Berry, 1992).

This became a pillar of modernism which Oelschlaeger (1991, Pg 68) defines from an environmental perspective by highlighting its purpose: to transform “worthless wilderness into industrialized democratic civilization”.

### **2.1.2 - Resource Conservation**

Resource Conservation places value on the environment only in its relationship to humanity; wilderness needs to be protected for future generations (of humans). Resource conservation is modernism in the process of discovering that resources are not inexhaustible.

Twentieth-century resource conservation was based on the following precepts:

- Ecosystems are constructed of different parts that are placed together like a machine.
- The Eco-machine can be manipulated externally by humans (who are not part of it) to produce particular outcomes.
- Those outcomes are determined by a market which is democratically driven towards maximizing broad social and economic well-being (Oelshlaeger 1991).

### **2.1.3 - Preservation**

The “future generations” motivation for environmental protection is shared by the “preservationists” (Oelshlager 1991, Pg 293) but their view of nature and wilderness differs from the resource conservationist view primarily in that the various components of an “eco-machine” interrelate in a manner that has an holistic identity: the ecosystem. For humanity to remain part of the ecosystem, dominion is euphemized into “stewardship”, justified by our intellectual prowess. It is therefore anthropocentric and so cemented into the crumbling substrate of modernism (Oelschlaeger, 1991 pg 289-292).

### **2.1.4 - Ecocentrism**

There is a critical ethical distinction between philosophies that rely directly or indirectly on modernism and those that are grappling for a post-modern grounding (Oelshlaeger 1991). From an environmental perspective, that distinction is delineated between modernist anthropocentrism and post-modern non-anthropocentrism.

Non-anthropocentrism primarily manifests itself as ecocentrism, where -

- life is dependent on natural systems so that they and their constituent parts have intrinsic value
- humanity is part of the natural process and not its purpose
- humanity's continuity is dependent on the intrinsic value of the whole so that actions which are genuinely beneficial to humans must be beneficial to the whole. If they are not beneficial to the whole, then they will ultimately harm humanity (Oelschlaeger, 1991).

Ecocentrism meets resistance from people who have individually or collectively profited or drawn religious comfort from the delusion of humanity's dominion over the natural world.

### **2.1.5 – The Wilderness Culture and Shifting Wilderness Values in South Africa**

Anderson and Grove (1987) point out that the implementation of colonialism involved administratively projecting a European perception of Africa onto the continent itself. The origins of African nature conservation are an extension of this phenomenon whereby areas were to be conserved in contrast to the industrially or agriculturally modified home countries. Furthermore, protected areas were to be managed for Eurocentric values; the word *game*, from the term *game reserve*, refers to meat or trophy animals that were to be aggressively protected from the vermin which included most of Africa's spectacular predators (Carruthers, 2001). The confusion must have been extreme when local people were banned from killing animals to perpetuate the colonial dream of a hunting safari.

Even when nature conservation was emerging as an ethical pursuit, initiated by the likes of Aldo Leopold in the United States or James Stevenson-Hamilton in South Africa, the emphasis of the relationship between humanity and the environment was focused on post-colonial settlers rather than those continents' original peoples. It is interesting to note that both Leopold and Stevenson-Hamilton advocated the minimizing of human intervention and manipulation of protected areas (Carruthers, 2001). As such, James Stevenson-Hamilton could well be seen as the founder of South African wilderness management principles, had his ideas not been replaced, in the Kruger National Park, by a more rigid and reductionist rationale (Draper, 2003).

By the time environmental protection was being legislated in the United States, many indigenous peoples had been displaced, eliminated or in other ways marginalized such that their consideration in protected area management was barely considered (Phillips, 2003).

Certainly the US Wilderness Act (1964, Pg1131) stipulated human exclusion: “man is a visitor that does not remain”. This, combined with the misperception that wilderness is a blank canvas which humanity has not yet blemished, has created ideological and political tension, especially in those parts of the world where the wilderness concept has been imported. The area referred to as Zululand in KwaZulu-Natal was one such area.

Whilst the history of the region is not the subject of this dissertation, its social complexity must be recognized, because the historical occurrences have shaped peoples’ responses to the land. The list below illustrates some of the issues that are interwoven into the social fabric of the region:

- The existence of San/Bushmen prior to the Nguni expansion into the area.
- The assimilation, migration or extermination of the San/Bushmen.
- The successive expansion of the Mtetwa and Zulu clans.
- The arrival of the English.
- The arrival of the Boer settlers.
- The Zulu/Boer conflicts.
- The Anglo/Zulu war.
- The Anglo/Boer war.
- The allocation of farmlands to servicemen returning from the Second World War.
- The political tension between English and Afrikaans speaking white South Africans.
- The forced removal of black South Africans off farm land allocated to white South Africans.
- The resettlement of black people on *empty land*.

By the time the wilderness concept was imported to Zululand, the area had been through such a tumultuous social history that parts of it had regained the illusion of being an *untouched wilderness*, at least in recent times.

The wilderness concept was introduced into the Zululand region in the 1950s by Jim Feely, a conservation officer and voracious reader. He passed on to fellow ranger, Ian Player, *the 11 Fundamentals of the Wilderness Concept* (Feely, 2009). In response to these, Player (Player, 1996) wrote, “I was overwhelmed and a fierce determination arose within me to have some areas in the Zululand game reserves set aside for people to walk, ride or canoe”. A motivational paradox is evident here because the wilderness advocates (including Trippensee, Leopold, Stevenson-Hamilton and Player) wanted to protect the vanishing wildness from people, and simultaneously for people.

Whilst wildness may be a geographical or ecological entity, Beinart and Coates (1995) point out that wilderness is a political concept that strives to represent the characteristics of wildness. As such, the politics of wilderness protection in the US during the 1950s and 1960s was carried out in the ambient political climate which was neither decentralized nor culturally encompassing.

The policy for protected areas in South Africa was not dissimilar: to isolate parks from potential external threats which included human habitation and consequent social/industrial/agricultural modifications (that would threaten the wildlife) or unchecked tourist development (that could erode the parks’ wild character).

The Imfolozi Game Reserve was to be perceived by local black communities as a pocket of land where the animals, and particularly white rhinoceros, were prioritized over people; these resentments were often “suppressed” by romanticized versions of Hluhluwe-Imfolozi’s history (Brooks, 2000, Pg 76).

But the situation regarding the Zululand reserves is more complex than that described by a black/white schism on the protection of wilderness, because many white politicians and land owners were opposing wilderness preservation and many of the white conservation officers in the Zululand reserves had forged strong friendships with the Zulu elite (Player, 1999 and 2009). Such alliances went against the political tide and the Apartheid laws of the time. Many of these friendships have endured decades and on a number of occasions resulted in threats to the Imfolozi Wilderness being thwarted by Zulu political influence. For example, plans to develop a large tourist camp on the edge of the Imfolozi Wilderness Area were opposed by the South



African Minister of Home Affairs and long standing friend of Ian Player, Dr Mangosuthu Buthelezi in 1998 (*Daily Mail*, 1998). Such bonds between white officers and the Zulu elite and the role that these relationships played in preserving the Zululand protected areas does not support Shirley Brooks's perception of a racially polarized acceptance of the wilderness concept.

What is, perhaps, a more accurate perspective is that the strategy to protect wilderness was top-down and so excluded the sentiments of local black communities. But this hierarchical management style was not unique to protected areas: it was the common organizational structure of the time. Nevertheless, the perception of wilderness as an elitist concept thrust upon the spatially dispossessed inhabitants of the developing world is one that has arisen too many times and in too many regions for it not to have credence, including South America, Australia, Southern Africa as well as the original inhabitants of developed nations like Canada, Finland and the United States (Draper, 2003 and Diegues, 2002).

Before the recently attributed biodiversity benefits of wilderness, the developed world has always retained wilderness's romantic mythology. No sooner had colonialism celebrated the conquering of the wild frontiers, along with either the destruction or "civilization" of its inhabitants, when "romanticism set out to protect this newly conquered wildness against the accepted growing pains of colonization" (Zealand, 2007, Pg 13). The value of wilderness as a product of rarity was seldom perceived by indigenous or local peoples whose only part in the concept's ironical ontogeny was to be culturally steamrolled by the colonial power.

Wilderness has been labelled as Cartesian, un-philosophical and unscientific (Zealand, 2007) and its association with post-colonial romanticism and conservative politics has caused many policy advocates to avoid the concept altogether (Draper, 2003). In such light, the cause of wilderness looks doomed, and yet in spite of its early justifications becoming eroded or being deemed politically incorrect, the legacy of wilderness has re-emerged with modern, scientific and liberal justifications. Once its meaning shifts beyond a quaint preservation of an idealized un-peopled landscape trapped in time, the broader relevance of wilderness in the 21<sup>st</sup> century may unfold along with "some untapped allies" from the developing world (Draper, 2003, Pg 61).

The philosophical redefinition of wilderness is by no means complete. Scientists, sociologists and

philosophers, diametrically opposed to the previous isolationist and exclusive form of wilderness, are re-visiting the concept in its more liberal and inclusive format as part of their investigation into humanity's unsustainable relationship with the world (Swimme and Berry, 1992). Such thinking produces exciting implications for managers of wilderness areas because it implies that they are managing land with additional values that modern society is only just beginning to appreciate. If wilderness does indeed contain hidden or undiscovered values, it may be difficult to assess the threats to such areas comprehensively, implying the desirability of the precautionary principle (IUCN, 2003).

This has two implications which may not sit well together. Firstly, the management of the emerging concept of wilderness has to be inclusive of the new and emerging views, as well as those views that were previously excluded. Secondly, the mechanisms that are used to manage wilderness have evolved out of the previous way of thinking and until they have been reformed, will still retain language and application which are inappropriate to a more inclusive concept of wilderness (see 5.8 in the conclusion which refers to the evolution of wilderness management terminology). For example, using the word "resource" to describe a range of mountains or a herd of buffalo may undermine the perceived sacredness of those entities by a particular group of people or the intrinsic rights of buffalo or mountains advocated by another group of people. So what is required here is for all those involved in the process of wilderness management to proceed cautiously, respectfully and, because of the diversity of contributors, without the imposition of a rigidly desired outcome.

From this, it is clear that the required management philosophy must be one that embraces the advantages of diversity whilst possessing inbuilt mechanisms to cope with the accompanying complexity. Diverse alliances (perceived as a necessity by the IUCN) replace the notion that conservation agencies must singularly shoulder the responsibility of environmental protection (Adams, 2006). This points to systems of co-management, a necessity for the Hluhluwe-Imfolozi Park with one successful land claim so far. Whilst the mechanics of the co-management agreement will be arranged between the landowners and Ezemvelo KZN Wildlife (see 4.2) it is important that the structure of the agreement does not get in the way of the process; the emphasis of such agreements should be on problem solving where power sharing is a product and not a prerequisite (Carlsson and Berkes, 2004).

According to Carlsson and Berkes (2004) the various understandings of co-management agreements have three things in common:

- They are concerned with the use of the natural environment or components thereof.
- They bring together contingents from the public, private sectors and especially local communities.
- They stress that co-management agreements are not static arrangements but rather dynamic entities.

There is a fourth commonality:

- That all of the definitions recognize the environment purely as a resource, power over which is to be divided between various factions of people.

That such a philosophy was largely responsible for the impending environmental crisis (Quinn, 1992) is omitted either as an oversight or because the alternative (where the environment is perceived as an integral, albeit silent, partner within any co-management agreement) would be unpopular. When ignored, the environment seems to find its own voice. For example, the Lower Umfolozi District community has developed an enthusiastic interest in the management of water catchments, motivated by 24,000 people from that area contracting cholera in the summer of 2000 (Hoque *et al*, 2002).

Two emerging themes are affecting the direction of wilderness management in Imfolozi and, furthermore, these two themes counterbalance each other. Firstly, the isolationist view of the Hluhluwe-Imfolozi Park and its wilderness area is over (Ezemvelo KZN Wildlife, 2009a). As suggested in the *Guidelines for Protected Area Management Categories* (IUCN, 1994), co-operation and planning strategies are being forged between the park and the surrounding district municipalities. New and still vulnerable relationships between surrounding communities and the park could result in meaningful partnerships that benefit those communities, whilst securing the essential properties of the protected area.

The second theme that has affected wilderness managers is to avoid compounding the errors of the past by adhering to an anthropocentric view of humanity's relationship with the environment. One of

the core purposes of protected areas is to play that crucial role in the larger environmental crisis, to conserve biodiversity. The South African public, in proclaiming the southern part of Imfolozi as a wilderness area, is inferring “strict protection” (IUCN, 1994, Pg 7). A public process that undermines the protection of that wilderness would stand in opposition to global conservation strategy (Locke and Dearden, 2005).

The combination of these two themes suggests that ecocentric values may become the prerequisite for beneficial public participation. In the light of these philosophical shifts, it would appear that the wilderness area of Imfolozi, with its spiritual significance, has a future where it is secured as a sacred component within a larger protected area. With the effort and openness of all concerned, a new management methodology could be developed so that regulations, boundaries and restrictions are not imposed on the community but owned by them.

## **2. 2 –THE LEGAL FRAMEWORK FOR THE IMFOLOZI WILDERNESS**

This part examines the emerging proclamation of the wilderness area and what conditions need to be met.

### **2.2.1 - Statutes Pertaining to the Imfolozi Wilderness Area**

The National Environmental Management Act, No. 107 of 1998 (NEMA, 1998), is the over-arching environmental management legislation that brings into existence two interrelated statutes: the National Environmental Management: Biodiversity Act, No. 10 of 2004 (hereafter referred to as the Biodiversity Act or NEMBA) and the National Environmental Management: Protected Areas Act, No. 57 of 2003 (hereafter referred to as the Protected Areas Act or NEMPAA). The absence of wilderness from earlier drafts indicates that its inclusion within the Protected Areas Act happened as a result of the public participation phase of the policy cycle. This becomes significant where there is local resistance to wilderness because there may be more national voters in favour of the concept than local voters opposed. In other parts of the world this has resulted in a politically messy situation where wilderness protection proceeds in spite of local opposition (Nash, 1982).

The KwaZulu-Natal Nature Conservation Act, No. 9 of 1997 (Pg19) makes provision for the “institutional structures for nature conservation in KwaZulu-Natal”, which includes delegating most responsibilities (with the notable exception of drawing up regulations) to appropriate departments: the Board of the KwaZulu-Natal Nature Conservation Service (Ezemvelo KZN Wildlife), its local boards, its Chief Executive Officer or through him/her any of the Ezemvelo KZN Wildlife staff. The manner in which delegation to and within the management authority is described within the Act, prescribes a top-down management system where linear lines of accountability will make cooperative or collaborative management systems cosmetic, at best.

### **2.2.2 - Proclamations and Land Claims**

Part A of the Second Schedule of the KwaZulu-Natal Nature Conservation Act (1997) lists the proclamations and amendments to nature reserves in KwaZulu-Natal, including those comprising the Hluhluwe-Imfolozi Park:

- The Hluhluwe Game Reserve, proclaimed in 1897 with six subsequent amendments.
- The Corridor Game Reserve, proclaimed in 1989.
- The Umfolozi Game Reserve, proclaimed in 1897, with ten subsequent amendments.

The Corridor Land Claim, comprising 24210 ha submitted by households from the Hlabisa-Mpukonyoni communities (Commission on the Restitution of Land Rights, 2007), was successfully awarded in June 2007 on the condition that the land use remained unchanged (Myrtle, 2007). Ezemvelo KZN Wildlife and the land owners are to enter into a co-management agreement. Approximately 6000 ha of the total claimed area is in the eastern portion of the wilderness area.

### **2.2.3 - A South African Definition of Wilderness**

A wilderness area is defined by the Protected Areas Act as “an area designated in terms of section 22 or 26 for the purpose of retaining an intrinsically wild appearance and character or capable of being restored to such and which is undeveloped and roadless, without permanent improvements or human habitation” (2003, Pg 12). (See section 2.3.3 for the significance of the South African definition prohibiting human habitation.)

Section 26 (2) of the Protected Areas Act (2003) lays out what wilderness areas are for: namely, the protection of natural character and biodiversity, natural and cultural resources, solitude and, interestingly, the provision of environmental goods and services. It goes on to say that access is conditional and limited to “non-mechanised means” (Pg 22). Of the four ways land can be protected as wilderness (two pertain to private land and one as a direct designation under law), the Imfolozi Wilderness will receive protection “by classification under the zonation and management regime within an existing state protected area” (Bainbridge and Lax, 2006, Pg 400).

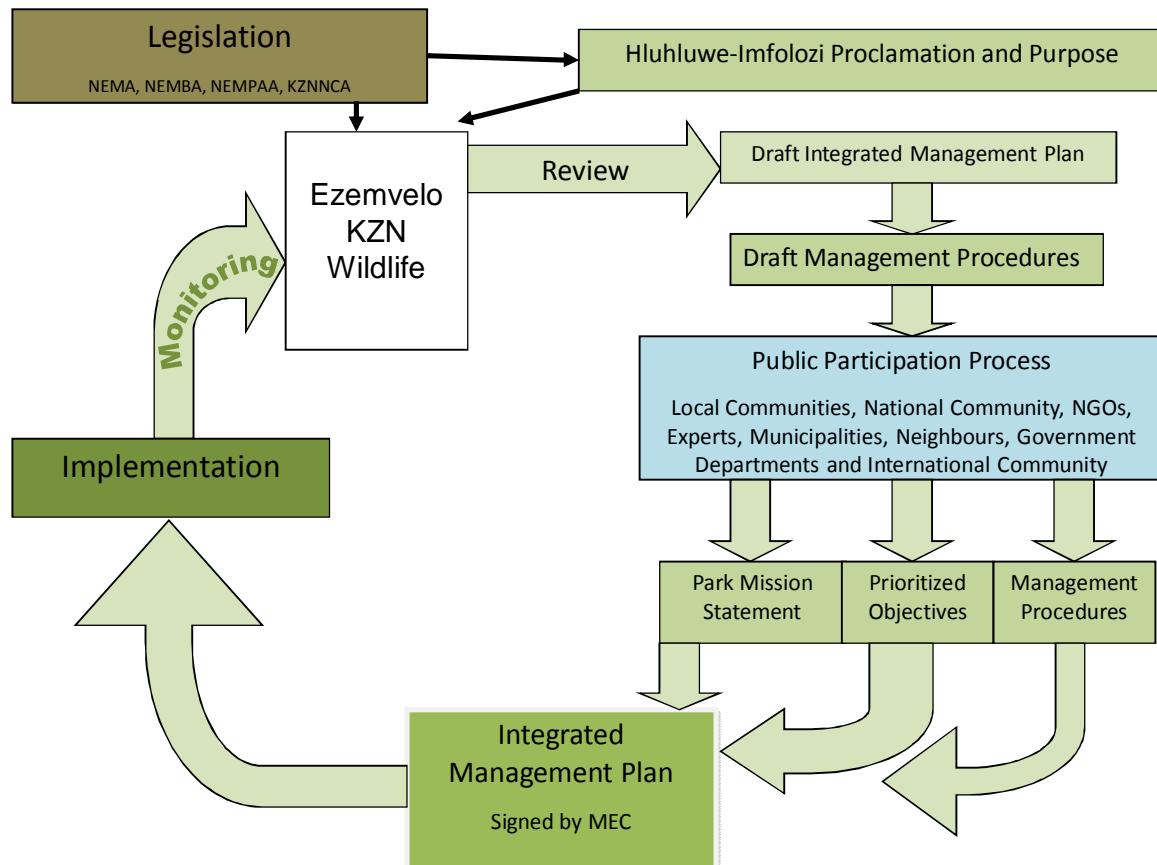
Two crucial aspects of the 2003 Protected Areas Act will, if utilized appropriately, transform South African protected area management into a progressive, interactive and dynamic process. The first is that management plans for parks must be signed by the minister/Member of the Executive Council (MEC) (NEMPAA, 2003); once this is done, the provisions of the management plan effectively become law. Legal authority and accountability is therefore applied at park level.

#### **2.2.4 - Policy Formation and Implementation**

The second crucial aspect is that the management plans for parks must be compiled with rigorous public participation and be cohesive with the integrated development plans of appropriate municipalities (NEMPAA, 2003). This means that the mandate handed to managers, whilst ultimately emanating from the Minister/MEC through the management authority, has direct input from the community. Functionally, these two aspects create an additional policy cycle at park level (see Figure 2).

The challenge here is for both park authorities and communities to put aside historic distrust and hostility and to actively participate in the system. In wilderness areas, such co-operation is particularly necessary, for human access is being restricted. A policy cycle that emphasizes direct participation with park management replaces the top-down impositions of old; it creates a structure where the community is setting that land aside as special and/or sacred, and personally empowering the management authority to implement protection (Mkhize, 2009).

**Figure 2 - Localized policy cycle for the Hluhluwe-Imfolozi Park**



Through communication initiated by such a cycle, common ground can be sought between the communities' need to increase their involvement and derived benefits and the authority's need for increasing environmental protection. The challenge is to develop these needs into an over-arching policy where discrepancies between society's need for environmental protection (green issues) and the equitable use of and access to the environment (brown issues) are circumvented through meta-narratives (See Section 2.4.1 and Figure 13 in Section 3.5). Table 1 outlines what such a process may yield.

Until the signed management plan legally authenticates the existence of the Imfolozi Wilderness Area, its designation is reliant on an Ezemvelo KZN Wildlife policy (Ezemvelo KZN Wildlife, 1999). Consequently, the wilderness area, whilst being acknowledged by the public, is not acknowledged in the World Database on Protected Areas (World Commission on Protected Areas, 2008).

**Table 1: An example of integrated policy**

Possible plan	Benefits	Threats
<p>The Zululand District Municipality expressed the desire for development in its region to be in keeping with the potential derived benefits associated with the park: in particular, tourism potential. In order for a greater number of communities to gain access to the perceived “cash cow” of HiP, it makes sense to fatten the cow and share the ownership. In other words, the surrounding communities may wish to increase the size of the protected area whilst retaining ownership/influence of their portions. Consequently, the Zululand Integrated Development Plan links the Hluhluwe Imfolozi Park with the Opathe Game reserve near Ulundi. Other communities could adopt similar strategies along the southern and eastern boundaries.</p>	<ul style="list-style-type: none"> <li>• Increased community participation in management</li> <li>• Communities adjacent to the wilderness area could derive benefits from the inclusion of non-wilderness land added to the southern boundary.</li> <li>• An effective buffer around the southern wilderness boundary (see figure 1).</li> <li>• Range expansion for endangered species and elephants (alternative to culling).</li> <li>• Connections with other parks.</li> <li>• Increased opportunities for tourism.</li> <li>• Increased community involvement in rhino protection.</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of community control.</li> <li>• Corruption.</li> <li>• Concessions resulting in exclusivity.</li> <li>• Costs associated with protected areas and management authorities.</li> <li>• Historic problems associated with Community Conservation Areas and Integrated Conservation and Development Projects.</li> </ul>

Currently the Hluhluwe-Imfolozi Park is registered as a Category II protected Area (National Park) (Terrestrial Ecosystem Monitoring, 2008). A real local and national victory would be to have the park registered with the IUCN under a split classification: the northern part remaining Category II and the wilderness area gaining Category Ib (wilderness) status. Such a step would illustrate South Africa’s commitment as a signatory of the Convention on Biological Diversity (UNEP, 1992, Glazewski, 2000 and Mkhize, 2009). In the light of this, the IUCN definition of wilderness is important.

The IUCN (1994, Pg17) defines wilderness 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”.

Remembering that the categories describe management objectives rather than area descriptions



(IUCN, 1994), the application of an internationally recognized wilderness management system will oil the wheels of the IUCN Category Ib application process. (The pursuit of IUCN classification will be examined in the conclusion in Section 5.10.) This would create a solid platform for the next step: the wilderness area's direct classification under law.

## **2.3 – TOWARDS INTEGRATED MANGEMENT FOR THE IMFOLOZI WILDERNESS**

### **2.3.1 Management Systems within Ezemvelo KZN Wildlife and the Hluhluwe-Imfolozi Park**

Delegation to and within the management authority is described within the KwaZulu-Natal Nature Conservation Act, No. 9 (1997). The CEO chairs the Executive Committee, consisting of the executive directors of the four divisions: Corporate Support Services, Commercial Operations, Biodiversity Conservation and Finance. The province is divided into three regions, each with a Regional Operational Committee consisting of middle management from each of those four divisions to facilitate broad-based decision making encouraged by the IUCN (Davey, 1998). The committee is chaired by the General Manager of Biodiversity Conservation. Each region is divided into a number of districts overseen by Biodiversity Conservation Coordinators who are responsible for the District Conservation Manager and the Conservation Managers of each park. (Ezemvelo KZN Wildlife, 2005a) As mentioned above in Section 1.3, the Hluhluwe-Imfolozi Park has two park managers, one for Hluhluwe and the other managing Imfolozi, including its wilderness area.

The KwaZulu-Natal Nature Conservation Act (1997) and consequently Ezemvelo KZN Wildlife's Corporate Strategy (Ezemvelo KZN Wildlife, 2005a) make provision for Local Boards, in particular protected areas (including the Hluhluwe-Imfolozi Park). These boards are made up of an Ezemvelo KZN Wildlife staff member (ex-officio), members from surrounding communities, tribal authorities, municipal councils as well as representatives from the ecotourism, agricultural and business sectors. The purpose of these local boards is to integrate the management of the park with the surrounding areas by making local decisions and playing the influential role behind the management plans (Ezemvelo KZN Wildlife, 2005a). Theoretically, this should lead to a highly co-operative system and would immediately shift the management system in the direction outlined by the IUCN and the World Parks Congress (Thomas and Middleton, 2003). The

efficacy of local boards has been undermined by individuals who use the positions to influence management decisions in favour of their private business endeavours or by board members with the primary goal of seeking remuneration in return for their input. As a result, the contribution made by local boards within the Zululand region has eroded or disappeared. (Havemann, 2008).

What is concerning is that the continuance of the wilderness area as an entity is inextricably entwined with the management of the park as a whole; this management must be collaborative. The surrounding communities have voiced their desire to derive direct and indirect benefits from what is perceived to be the cash cow of Hluhluwe-Imfolozi Park's ecotourism potential (Ezemvelo KZN Wildlife, 2007a). Wilderness will not receive approval from the community as an island of exclusion unless the community, through participative management, enacts the exclusion themselves and has the opportunity to derive benefits from the surrounds. It should be noted that co-operation between management authorities and communities is acknowledged as a slow process of building trust and should be viewed as an ongoing process rather than something to be rushed through and structured at the beginning (Carlsson and Berkes, 2004). The positive benefits of improving community relations, both within the co-management agreement and outside of it, are enormous; the possibility exists for corridors linking Hluhluwe-Imfolozi Park with other protected areas where the community would own and derive all benefit from those corridors (see Section 5.8). The significance of such corridors to biodiversity conservation has been stressed as a goal at the World Parks Congress in 2003 (IUCN, 2005).

Strategies for the future of the park will be affected by the following issues, each of which could warrant a scenario planning exercise:

- Land use in surrounding areas – mining and subsistence agriculture.
- Population pressure - the need for more derived benefits from the park as reflected in the municipal Integrated Development Plans.
- Pressure for more recreational use from ecotourism industry.
- Fuel prices affecting air travel and the ecotourism market.
- Habitat change as a consequence of external factors.
- Alien diseases resulting in the prohibition of rhino translocations.

### **2.3.2 Management Plans**

“The protected area management planning process requires participation from the Park’s stakeholders, the general public and specialists during the various stages of plan development and implementation.” (Ezemvelo KZN Wildlife, 2009a, Pg x). For this reason, Ezemvelo KZN Wildlife refer to their management plans as Integrated Management Plans or IMPs. They are intended to span five years but with an adaptive management approach that will ensure ongoing feedback and annual reviews (Ezemvelo KZN Wildlife, 2009a). It should be noted, however, that annual adaptations to the plan may not deviate from the core objectives signed by the MEC (see 2.3.4); where they do, their implementation must be delayed until the next five-year cycle.

The objectives for the Hluhluwe-Imfolozi Park were listed and prioritized within a public participation process. Four of the first five objectives refer to biodiversity conservation, endangered species, the threats of alien plants/diseases and the proclamation of the wilderness area, for both its biophysical and spiritual significance (Ezemvelo KZN Wildlife, 2009a). Through consensus, the public participation process has therefore supported the existence of the wilderness area. The approved IMP will outline the nature of that protection with accountability being handed to Ezemvelo KZN Wildlife. Does this imply that Ezemvelo KZN Wildlife may implement access restrictions at will? Certainly not! But nor does it mean they may relinquish their responsibility to the strict protection that the category of wilderness implies. The obligation from here on is for Ezemvelo KZN Wildlife to find a consultative means of managing the wilderness area that does not negate the mandate handed to them to maintain the area’s wilderness character.

### **2.3.3 Wilderness Management**

Hendee and Dawson (2002) point out that the manner in which wilderness values are understood and perpetuated will determine the efficacy of wilderness management efforts. The scientific, experiential, symbolic, spiritual and economic values of wilderness listed by Hendee and Dawson (2002) are fleshed out by Shroyer, Watson and Muir (2003) into a list accentuating a South African perspective:

- Water conservation
- Spiritual fulfillment/sacred values
- Healing
- Pharmaceuticals
- Economic/income
- Quality of life
- Scientific
- Biodiversity protection
- Protecting endangered species
- Appreciative/experiential
- Wildlife conservation
- Traditional knowledge
- Education
- Personal growth
- Cultural preservation
- Resource harvesting
- Identity (cultural icon)
- Undefined or unanticipated future values

(Quoted verbatim from Shroyer *et al*, 2003, Pg 43)

*The Report of the Society of American Foresters' Wilderness Management Task Force* commissioned by the Society of American Foresters (1989) formulated a set of principles for managing wilderness establishing that consequent interventions would adhere to the letter and spirit of the US Wilderness Act (1964). They listed sixteen principles which are listed below in Table 2. They are significant to the Imfolozi Wilderness Area in that they have been converted, virtually unchanged, into the objectives appearing in the Wilderness Management Plan (Ezemvelo KZN Wildlife, 2000 and Densham and Conway, 2003).

The original wilderness management principles were periodically modified and condensed from sixteen to thirteen principles to have broader application (outside the United States) and also to take cognizance of the wilderness concept's evolution (Hendee, 1990 and 2002). By the time wilderness areas were being demarcated and proclaimed in the US and South Africa, previous social calamities had resulted in those areas being cleared of local inhabitants (Draper, 2009) so that their definitions of wilderness exclude human habitation (Wilderness Act, 1964 and NEMPAA, 2003). This is significant because wilderness legislation emanating from the US or South Africa appears to be adhering to an isolationist philosophy when in fact the issue of human occupancy in wilderness did

not apply when it was being promulgated.

In other parts of the world, this is not the case; hostility towards the isolationist view of wilderness (detailed above in Sections 2.2.5 and 2.2.6) indicate that further inclusions to a general set of wilderness management principles may be necessary to recognize indigenous peoples living in and neighbouring communities relying upon wilderness. The IUCN (2005) stipulates that the knowledge of indigenous peoples and communities should be included into management practice.

To many indigenous peoples the wilderness that they depend on is perceived as more than a resource for utilization (Lachapelle *et al*, 2003) but rather as a sacred entity. In some cases it is conceptually beyond human ownership. It is difficult to integrate such sentiments with an anthropocentric legal system (Berry, 1999 and Cullinan, 2002).

Consequently, a generalized set of management principles should reflect the ecocentric values of those peoples (described above in section 2.4). An ecocentric emphasis, recognizing the intrinsic rights of nature's constituent parts, complements the justification for wilderness as a means of protecting biodiversity.

Further modification of the principles of wilderness management is therefore necessary. These modifications must, paradoxically, include greater community involvement and the intrinsic rights of nature in order to truly reflect 21<sup>st</sup> Century wilderness values held by the developed and developing worlds. Whilst this must be a highly collaborative task and a time consuming one, the right hand column of Table 2 offers an opening possibility.

It should be noted that the wilderness movement's enthusiasm to embrace the concept of indigenous peoples' and local communities' close association with wilderness is nevertheless conditional: the lifestyles of such people should not threaten, through social modification, the wild character of the land. This perception is what McNeely and Pitt (1985, Pg 19) refer to as "enforced primitivism"; the social evolution of a community could result in its exclusion as a stakeholder.

**Table 2 - The evolution of wilderness management principles from 1989 to 2002.** Note: the right hand column represents the starting point for further modifications in keeping with the inclusion of indigenous peoples, community involvement, biodiversity conservation and ecocentric values. The numbering systems have been altered to align compatible principles.

INITIAL WILDERNESS MANAGEMENT PRINCIPLES - SOCIETY OF AMERICAN FORESTERS - 1989	REVISED WILDERNESS MANAGEMENT PRINCIPLES - JOHN HENDEE - 2002	POSSIBLE MODIFIED WILDERNESS MANAGEMENT PRINCIPLES
1. Attain the highest level of purity in wilderness character within legal constraints.	1. Manage wilderness as the most pristine extreme on the environmental modification spectrum.	1. Manage wilderness as the most pristine extreme on the environmental modification spectrum.
2. Manage wilderness as a distinct resource with inseparable parts.	2. Manage wilderness comprehensively, not as separate parts.	2. Manage wilderness as an interconnected yet intrinsic entity.
3. Manage the use of other resources and activities within wilderness in a manner compatible with the wilderness resource.	3. Manage wilderness and sites within, under a non-degradation concept.	3. Manage wilderness and sites within, under a non-degradation concept.
4. Allow natural processes to operate freely within wilderness		4. Encourage natural processes and the continuation of biotic and abiotic integrity of wilderness through active/cooperative management of human influences and the enactment of the precautionary principle.
5. Preserve wilderness air and water quality.		
	4. Manage human influences, a key to wilderness protection.	
6. Produce human values and benefits while preserving wilderness character.	5. Manage wilderness biocentrically to produce human values and benefits.	5. Encourage long term human values and benefits, including ecosystem services associated with biodiversity, cultural association and conditional occupancy, traditional harvesting, opportunities for solitude and recreation; achieve this through the ecocentric management of wilderness, where humanity's dependence on the environment is recognized and acted upon.
7. Preserve outstanding opportunities for solitude or a primitive or unconfined recreation experience in each wilderness.		
8. Favour wilderness-dependent activities when managing wilderness use.	6. Favour wilderness dependent activities.	6. Favour wilderness dependent activities.
9. Exclude the sight, sound and other tangible evidence of motorized equipment or mechanical transport wherever possible within wilderness.	7. Focus management on threatened sites and damaging activities.	7. Focus management on threatened sites and damaging activities.
10. Remove existing structures and terminate those uses and activities not essential to wilderness management or not provided for by law.		
11. Control and reduce the adverse physical and social impacts of human use in wilderness through education and minimum regulation.	8. Set carrying capacities as necessary to prevent unnatural change.	8. Engage in sustained environmental monitoring to determine levels of acceptable environmental change in wilderness and through collaboratively constructed management plans, with specific area objectives, affect appropriate education and action.
	9. Monitor wilderness conditions and experience opportunities to guide long-term wilderness stewardship.	
12. Establish specific management objectives, with public involvement, in a plan for each wilderness.	10. Guide wilderness management using written plans with specific area objectives.	
13. Accomplish necessary wilderness-management work with the "minimum tool"	11. Apply only the minimum tools, regulations or force to achieve wilderness-area objectives	9. Accomplish necessary wilderness work including the application of management interventions and regulatory systems with the "minimum tool"
14. Manage wilderness with interdisciplinary scientific skills.		10. Manage wilderness with strong community/public involvement in conjunction with interdisciplinary skills (philosophical, scientific and social)
	12. Involve the public as a key to the success of wilderness management.	
15. Harmonize wilderness and adjacent land-management activities.	13. Manage wilderness in relation to management of adjacent lands.	11. Manage wilderness in relation to management of adjacent lands.
16. Manage special exceptions provided for by wilderness legislation with minimum impact on the wilderness resource.		12. Manage special exceptions provided for by wilderness legislation with minimum impact on wilderness.

As mentioned above in Section 1.3, the Imfolozi Wilderness Management Plan was introduced in 1995 and implemented through the Wilderness Area Steering Committee and park management. The focus of the document is to plan for management actions concerning biodiversity conservation, education and recreation with “minimal human intervention” (Densham and Conway, 2003, Pg 7). The effects of implementation are monitored during an annual *wilderness audit*, the results of which are presented at the next Steering Committee meeting where management interventions would be discussed. The wilderness audit process is scrutinized in Section 3.8.1.

The Wilderness Area Management Plan has itself been reviewed a number of times since its inception. The most recent call for a review (Ezemvelo KZN Wildlife, 2006) has initiated a revision of the wilderness area’s zonation and the determining of what activities can take place in each of the zones. The functional and legal necessity of this forms the motivation for this work. The cycle of formulating a plan, implementing it, monitoring the effects of the plan and then modifying it after a review, follows the IUCN guidelines set out by Thomas and Middleton (2003).

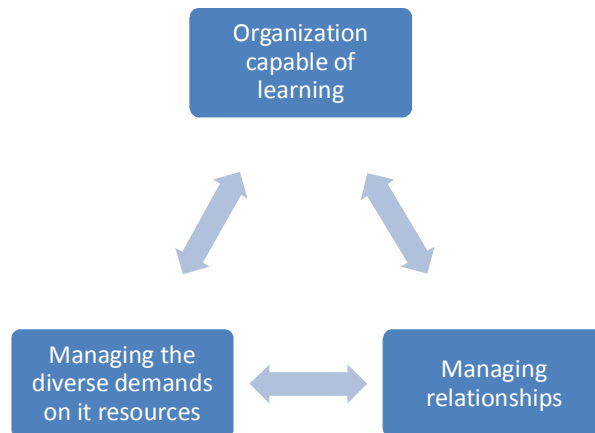
Ezemvelo KZN Wildlife’s commitment to adaptive management, where acting only from established knowledge is replaced with a more dynamic interplay between planning, doing and reviewing (Fincham *et al*, 2004), would make the organization more responsive to other challenges. Figure 3 illustrates a framework developed by the University of Montana and the University of KwaZulu-Natal to integrate tourism and biodiversity values in the Kruger National Park (McCool, 2004) but it really applies to any conservation organization which must build knowledge and relationships without relinquishing the primary purpose of protecting protected areas.

If an organization can give equal attention to retaining these aspects, then it is likely to overcome much of the inertia that plagues 21<sup>st</sup> century protected area management. Such attention will be invaluable in navigating towards the participative management of the Imfolozi Wilderness Area.

The public participation process for the Hluhluwe-Imfolozi Park’s IMP revealed both successes and challenges. On the one hand, the process resulted in a collaboratively compiled vision and mission statement for the park, along with a prioritized list of objectives which will determine management direction for the next five years. The IMP includes a strong emphasis on the proclamation of the

wilderness area. The community highlighted the spiritual significance of the wilderness area (Ezemvelo KZN Wildlife, 2009a).

**Figure 3 - A conceptual framework for capacity building (McCool, 2004, Pg 6 & 10)**



On a negative note, the level of participation and attendance for the three meetings was not consistent. My personal impression from the meetings is that the public participation process was approached by all parties with reservation, concern and even mistrust so that the possible benefits were debilitated. It will take time for a relationship to develop where Ezemvelo KZN Wildlife, the surrounding community members and other stakeholders can engage constructively; achieving such a situation is not a prerequisite for inclusive management of protected areas but rather an outcome of a long process that has to start somewhere (Carlsson and Berkes, 2004). As an on-going venture, the effort to build relationships must accompany the planning process and not delay it or induce “decision making paralysis” (Thomas and Middleton, 2003, Pg 29).

Regarding the Imfolozi Wilderness Area, there are two notable points, gleaned from the objectives of the proposed IMP, where consensus was reached:

- a. That there should be a wilderness area and
- b. That, like the rest of the park, it should be managed by Ezemvelo KZN Wildlife.



### **2.3.4 - Constraints Affecting Wilderness Planning**

Before going further, it may be useful to anticipate what other issues could hinder or derail subsequent planning processes. Table 3 compares problems that were identified in a North American study and which of those factors may pertain to the Hluhluwe –Imfolozi Park

**Table 3 – Planning Constraints**

<b>Protected Area Planning Constraints</b> (Lachapelle <i>et al</i> , Pg480-483).	<b>Weaknesses or threats pertaining to planning within Ezemvelo KZN Wildlife</b> (identified in the SWOT analysis of the EKZN Wildlife, 2005 Corporate Strategy, quoted verbatim – Pg 21).
Inadequate goal definition of the process.	Lack of consistency in application of policies and procedures.
Lack of trust.	Conflict between divisions.  Low staff morale.
Procedural obligations.	Cumbersome decision making processes.
Inflexibility.	Resistance to change and/or transformation.  Risk averse.
Institutional design.	Poor maximization of innovative ideas.  Lack of operational synergies.
Lack of understanding of the purpose and benefits of protected areas.	Ignorance of conservation values.
Lack of access by local rural communities to information on protected areas and programmes.	Poor communication.

The organization as a whole should be attending to these issues and attempting to create a general management system for Ezemvelo KZN Wildlife that can adapt to changing circumstances through the application of diversely sought innovative solutions. Whilst that pursuit continues at an organizational level, the same principles must be applied at a local level.

## **2.4 - INTEGRATED MANAGEMENT THROUGH THE IMPLEMENTATION OF THE LIMITS OF ACCEPTABLE CHANGE PROCESS**

The fourth principle of wilderness management that Hendee (2002, Pg 195) lists is “manage human influences, key to wilderness protection” (see Table 2). The growing human population has been identified as the greatest threat to wilderness (Roush, 1995). How human influences translate into impact depends on the type of activity and the behaviour of those associated with it, the amount and frequency of the activity and the sensitivity of the environment where the activity is occurring (Cole, 1990).

Human actions that affect wilderness can be divided into two categories:

1. Impacts that affect the ecological integrity of the area.
2. Impacts that compromise our human perception of wilderness (Cole, 1990).

### **2.4.1- The Evolution of the Limits of Acceptable Change Concept**

The idea of limiting either the type or amount of human influence indicates the necessity of defining a carrying capacity for humans in wilderness. Carrying capacity refers to the number of animals that can be supported in a given area (Krebs, 1978). Borrowing the carrying capacity concept was necessitated by wilderness recreation increasing to the point where it was threatening wilderness (Shelby and Harris, 1985 and Marion *et al.* 1985).

Adapting the carrying capacity concept so that it would restrict, modify or limit human interaction in wilderness was not easy, for the collection of data demanded a descriptive component and an evaluative component, both of which required value judgments. These could be difficult to replicate or defend (Shelby and Harris, 1985). The carrying capacity concept was applied to Imfolozi’s wilderness area in this manner, with limits reflecting existing human usage (Porter, 2003). Over time, wilderness managers expanded the concept of carrying capacity to mean appropriate wilderness management (Marion *et al.* 1985), all the while wondering why it was not working as the miracle tool.

The anthropocentric nature of the U.S. Wilderness Act (1964, Sections 2 a and c, Hendee, 2002) was always going to make limiting human access difficult. Those users of wilderness who do not want to be

limited can manipulate the interpretations of the anthropocentric Act to justify their continued activity. With an objective of promoting “sustainable utilisation of protected areas for the benefit of people” (Protected Areas Act, 2003, Pg 12), the provision for wilderness in South African law is similarly anthropocentric.

When the question of “*how much wilderness use is enough?*” could not be answered, the usefulness of carrying capacity receded until a different question was asked: *how much change in a wilderness area is acceptable?* (Lucas and Stankey, 1985) The answer to this question was the development of an array of systems designed to prevent ecological or aesthetic conditions in wilderness areas deteriorating beyond a collaboratively established standard.

Such systems would include Thresholds of Potential Concern (TPCs), Visitor Experience and Resource Protection (VERP), Limits of Acceptable Change (LAC), Visitor Impact Management (VIM) and Visitor Activity Management Processes (VAMP).

Not all the human impacts that affect the Imfolozi Wilderness Area are a consequence of recreational/visitor impact. Consequently, this study will not draw heavily from the planning strategies that focus on that issue exclusively. A comparison between the attributes of LAC, VERP and TPCs, in Table 4, reveals the differing emphases of these tools.

As the name suggests, Thresholds of Potential Concern serve the very useful purpose of warning managers when conditions are deteriorating. As a threshold is approached or exceeded, the first response is to examine the applicability of the threshold. If it is still found to be applicable then management intervention is investigated and, where appropriate, implemented (Biggs and Rogers, 2003). Such caution is laudable when applied to biological wildlife management but limiting human access to wilderness is primarily a “political process” (Stankey, 1997, Pg 10) where such deliberation might result in the process being steered away from its primary function: the collaborative continuance of its wild nature and its categorization, upon which all other human uses of wilderness depend.

Both VERP and LAC do produce sets of standards regarding human impacts on wilderness. Through consultation with the stakeholders, the nature and reach of the management interventions are arrived at collaboratively. When a standard is not met or, in other words, a limit is exceeded, the management authority may immediately intervene to realign conditions with the standard.

**Table 4 - The comparative characteristics of LAC, VERP and TCPs**

	<b>Limits of Acceptable Change (LAC).</b>	<b>Visitor Experience and Resource Protection(VERP)</b>	<b>Thresholds of Potential Concern (TPC)</b>
<b>Purpose</b>	To establish collaboratively determined limits for human impact on wilderness areas.	To collaboratively limit recreational impact through the prescription of future conditions which determine the required resource protection in terms of the areas objectives.	To alert managers to changes or potential threats within ecosystems.
<b>Impetus</b>	Issue driven.	Goal driven.	Condition driven.
<b>Focus</b>	Where defined management mandates are required for wilderness areas with conflicting objectives.	Where consensus oriented management intervention is required.	Any ecological situation  Where conditions fall within upper and lower levels of acceptability.
<b>Process</b>	A 10 step sequential process which can be repeated in whole or in part when necessary.	9 steps, flexibly sequential with feedback and feed-forward possibilities.	Cyclical.
<b>Application</b>	Human impact on wilderness areas.	Recreational human impact on protected areas.	A wide variety of ecological circumstances.
<b>Applicability outside wilderness areas</b>	Possibly but with limitations.	Yes.	Yes.
<b>Public participation</b>	Essential to the process.	Essential to the process.	Optional.
<b>Selection of indicators of change</b>	Indicators are selected prior to and for the purpose of directing monitoring.	Indicators are refined during the monitoring process.	The selection and use of indicators is ongoing throughout the process.
<b>Applicability other than recreational impacts</b>	Yes.	No.	Yes.
<b>Results/products</b>	Delineation of <b>standards</b> of acceptability, beyond which management intervention is required.	Delineation of <b>standards</b> of acceptability, beyond which, management intervention is required.	<b>Thresholds:</b> an early warning system, alerting managers to potentially harmful change.
<b>Success in dealing with conflict</b>	Designed specifically to deal with conflicting goals or objectives.	May adopt LAC type procedures to deal with conflict.	The flexibility of the system is designed to be sensitive to ecological change, not to engage with conflicting goals or objectives.

Information for this table was drawn from Biggs and Rogers(2003), Cole and McCool (1997a), Hof and Lime (1998), and Nilson and Tayler (1998).

As the table indicates, VERP is goal driven. This is particularly useful for areas where there is consensus regarding the purpose of proclamation and protection. The wilderness area in Imfolozi is supported for a number of different reasons and has a diverse range of stakeholders: neighbouring communities, land owning community members, ecotourism operators, wilderness NGOs and even diverse interests among managers, including law enforcement, education, endangered species protection, and wilderness recreation. Table 5 shows that the purpose and objectives for the wilderness area is different from each of these perspectives. Consequently, the IMP process (Ezemvelo KZN Wildlife, 2009a) as well as Ezemvelo KZN Wildlife's wilderness policy (1999) has identified the LAC process (which is built around issues and specifically designed to cope with conflicting objectives) as the mechanism to be used as the basis for wilderness management in Imfolozi. Furthermore, the extensive use of LAC (Hendee and Dawson, 2002) as well as its applicability to non- recreational impacts (although this is still under debate: see Merigliano *et al*,

1998), lends weight to its suitability.

**Table 5 - Potentially conflicting objectives and the resultant issues**

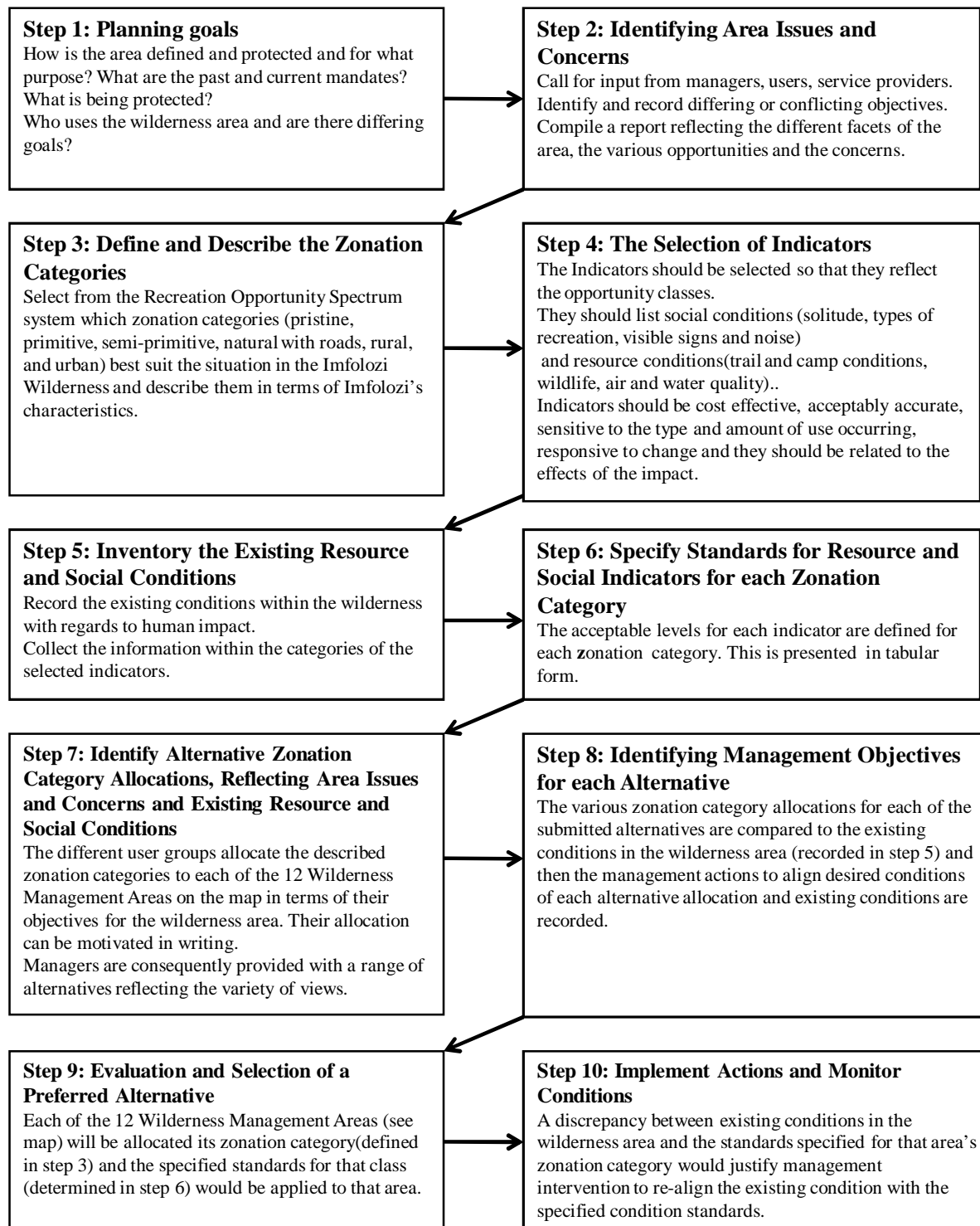
<b>Objective A</b>	<b>Objective B</b>	<b>Issue</b>
Education.	Recreation.	Over-crowding.
Endangered species habitat protection.	Education/recreation.	Disturbance to wildlife.
Law enforcement/anti-poaching activities.	Spiritual values of wilderness	Reduced opportunities for solitude.

The term “Limits of Acceptable Change” sounds deceptively simple and self-explanatory, often resulting in its glib usage that fails to recognize that it is a specific and complicated procedure that should only be applied under specific circumstances (Cole and McCool, 1997b). LAC (see figure 4) is described within the Hluhluwe-Imfolozi IMP as -

“a management framework for establishing acceptable and appropriate ecological and aesthetic conditions in wilderness affected by human-induced changes. After establishing area issues, concerns as well as differing goals within the context of the area’s proposed or existing proclamation, LAC explicitly defines the amount of change to be allowed by means of quantitative standards applied to specifically selected ecological and aesthetic indicators. These standards are collaboratively applied to the area after the results of monitoring are reviewed, resulting in the area being zoned in terms of the Recreation Opportunity Spectrum. It also identifies the appropriate management interventions to be applied when the defined acceptable standards within the area are not met. Thereafter, it establishes procedures for monitoring and evaluating management performance” (Cryer, 2008, in Ezemvelo KZN Wildlife, 2009a, Pg XIV and 26).

Public involvement in wilderness planning and management is a pre-requisite for success, especially where it involves limiting human access. As mentioned above, this is primarily a “political process” (Stankey, 1997, Pg 10) where the participative aspects of LAC may well be pivotal in determining the future of the Imfolozi Wilderness.

**Figure 4 –Flow chart depicting the Limits of Acceptable Change process and it application to the Imfolozi Wilderness Area**



Buist and Hoots, 1982, Stankey *et al*, 1985, Cole and McCool, 1997a

#### **2.4.2 – Clarification Regarding the LAC Process**

Whilst LAC is becoming a widely used planning process, few applications adhere to the step by step process (Dawson and Hendee, 2009). In both the third and fourth editions of *Wilderness Management: Stewardship and Protection of Resources and Value* a flowchart is presented that “portrays the essential elements of the LAC process, including several important additions to the original process” (Hendee and Dawson, 2002, Pg 237 and Dawson and Hendee, 2009, Pg 224). One of these deviations from the original process prescribes what happens when a limit of acceptability is exceeded; the Hendee/Dawson flowchart shows that the standard needs to be evaluated along with the sampling method that indicated the transgression. In other words, when a standard is exceeded the response is to scrutinize the monitoring and to examine the applicability of the standard. This adds a degree of flexibility, in that exceeding a limit of acceptability may be deemed acceptable after further scrutiny. So this addition converts the exceeding of standards from a red stop light to an orange warning light. This has been applied in practice in a number of instances: for example, when the highly functional *Threshold of Potential Concern* (TPC) system was said to have evolved out of LAC it would appear to have been derived from the *LAC with the Hendee/Dawson addition* version. Exceeding limits of acceptability in the TPC system “prompts an assessment of the cause of the extent of change. This assessment provides the basis for deciding whether management action is needed to moderate the change or whether the TPC should be recalibrated in the light of new knowledge and/or understanding” (Biggs and Rogers, 2003, Pg 63).

An essential aspect of the TPC system is that the parameters affecting the issue being studied need to be inclusively defined; if applied to wilderness management, this would require a common vision and a clear set of objectives so that the upper and lower levels of acceptable conditions could be realistically defined. But if there is consensus over the objectives of a given wilderness area then, by definition, LAC would not be an appropriate tool. Here lies the fundamental difference between the LAC and TPC systems and indeed between LAC and the Hendee/Dawson flowchart (depicting modified LAC). This difference between LAC and the Hendee/Dawson explanation of LAC is evident in three ways:

1. LAC is only a useful planning and management tool when there are conflicting objectives (Cole and McCool, 1997b).

2. Exceeding standards within LAC is analogous with a red stop light and not an orange warning one. When a standard is exceeded management intervention is applied, not further monitoring (Cole and Stankey, 1997). LAC applications where this has not been applied have encountered negative consequences (Ritter, 1997).
3. The formulators of the LAC process are not averse to deviations that could well improve their process, but they are specific in saying that substantial deviations should not be referred to as LAC (Cole and Stankey, 1997).

If there is conflict over the objectives of wilderness (trails, game capture, security, ecotourism, solitude, priority species conservation and so on) then the common vision required in the IUCN best practice manual (Thomas and Middleton, 2003) can be achieved through a meta-narrative approach which would say that the conflicting objectives can be included in a cohesive management system if that system is specifically designed to cope with those conflicting objectives (i.e. LAC). To ignore this and doggedly to pursue a unified set of objectives would be counterproductive, for it would result in either the temporary suppression unresolved differences or the “decision making paralysis” that Thomas and Middleton (2003, Pg 29) warn of. The manner in which the LAC process can collaboratively address and respond to conflicting issues is an example of adaptive management.

In spite of the traditional version of LAC being selected for the wilderness area of Imfolozi, the value of the Hendee /Dawson flow chart must be recognized, not only in instances where the complete ten step process is unnecessary but also for testing the efficacy of new indicators within a monitoring process. Without any doubt, it would increase efficacy and simultaneously eliminate stages that were not pertinent to that different objective. As Cole and Stankey (1997) suggest, such a process is worthy of a different name. In Imfolozi it was decided not to abbreviate the process and follow the entire ten steps because circumstances fitted classically within the range where LAC is appropriately applied (see Section 3.3). Relating a planning and management system to the IMP implies the necessity of legal accountability which needs the defined boundaries of LAC rather than the added flexibility of Hendee and Dawson’s addition or TPCs; nobody gets prosecuted for going through an orange traffic light.



## **CHAPTER 3 - METHOD - THE IMPLEMENTATION OF THE LIMITS OF ACCEPTABLE CHANGE PROCESS IN THE IMFOLOZI WILDERNESS AREA**

The outcomes of this project have both qualitative and quantitative components. The selection and implementation of a management system has a strong qualitative component, especially regarding the inclusion of evolving or alternative wilderness management viewpoints. An essential aspect of this project has been the monitoring of human influences where every attempt has been made to create a system that produces quantitative results that can be compared over time. From the perspective of Ezemvelo KZN Wildlife, who commissioned the work, the successful end point of the project is clear: an implemented, collaboratively established management system that enables the monitoring and mitigation of human influences on the wilderness area of the Hluhluwe-Imfolozi Park.

### **3.1 - METHODOLOGY**

#### **3.1.1 - Determining Features of the Methodology**

From the literature review it is evident that a methodology implementing an environmental monitoring and management system in the wilderness area of the Hluhluwe-Imfolozi Park must take cognizance of the following issues:

- The very concept of wilderness is evolving out of a history that many South Africans would consider politically, culturally or environmentally distasteful. Beyond its legal definition, there is little agreement about what wilderness is, what or who it is for and how or if it should be managed.
- The management team in the Hluhluwe-Imfolozi Park is mandated and therefore accountable for instituting a system of management for the wilderness area that
  - Is guided by legislation
  - Adheres to policy

- Carries out the objectives of the IMP (that were established with stakeholder input)
- Ezemvelo KZN Wildlife is a member of the IUCN and some of its policies are aligned with that body and yet South Africa's legislated protected area categories were not modelled on IUCN principles (NEMPAA, 2003).
- Active public participation, whilst having legislative backing, does not yet receive popular support from all managers. Moving towards this goal will be a slow trust-building process, often having to undo years of previous relationship damage. A selected management system will have to be designed on hopes for what a management authority/public relationship could become, rather than what it is now.
- Instituting a highly consultative management system may prove problematic in an organization that (in spite of its liberal sounding corporate strategy) is structured with a top-down pyramidal management framework (see Section 2.3.1).
- The importance of environmental issues has been escalating on international agendas of developed nations and decreasing in local agendas of developing nations. South Africa, with its dual nature, straddles a curious position where the emphases of environmental issues by some departments are undermined by others (Le Quesne, 2000).
- The problems associated with operating from a non-anthropocentric perspective of ecological systems cannot be overstated, for it has neither legal backing nor much popularity amongst South Africans. Ecocentric ecologists in the 21<sup>st</sup> Century must behave like navigators in the 15<sup>th</sup> Century, where they act in accordance with the new paradigm (a round earth as opposed to a flat one) but avoid the heretical stance of openly supporting it.

There are three features of this project that direct the methodology:

- The project stems from a Wilderness Area Steering Committee meeting where a decision was taken to modify the Imfolozi Wilderness Area Management Plan (Ezemvelo KZN Wildlife, 2006). As the magnitude of this venture was realized, it was transformed into a sanctioned research project to be conducted by the author through the University of KwaZulu-Natal. The desired outcome was to implement a prescribed planning and management system that would become the basis for an updated Wilderness Management

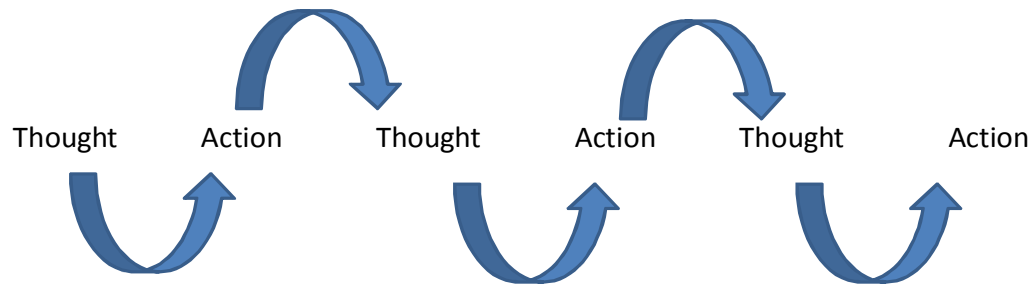
Plan. Whilst the management team was, in a sense, outsourcing the project to a researcher, at no point could they relinquish their mandate and accountability for the planning and management of the Imfolozi Wilderness Area. In this sense, they were both participants and co-designers in the process that was to be applied.

- Very early on in the project, the management team opted not merely to research the current impacts on the wilderness area and then recommend an appropriate planning and management system, but rather to implement a management system as the research process proceeded. The various stages in the implementation of the project involved a cyclical interplay between thought and action. Action was to be directed by the thoughts of the team. The outcome of that action precipitates more thought to formulate the next action.
- Whilst the management team is unable to relinquish either its responsibility or accountability in the management of the wilderness area, they are legally and organizationally encouraged to incorporate other individuals, departments and stakeholders in the decision making process (NEMPAA, 2003, Ezemvelo KZN Wildlife, 2005a and Thomas & Middleton, 2003). The logic behind this course of action is that decisions that are made in a participative manner are not only likely to be better (including aspects that could have been overlooked by the decision makers alone) but also less likely to be contested and more defensible when they are contested. This requires a process that can become increasingly inclusive whilst simultaneously defining how, where and to what extent participation can take place. It suggests an evolving collaborative process.

### **3.1.2 – Action Research**

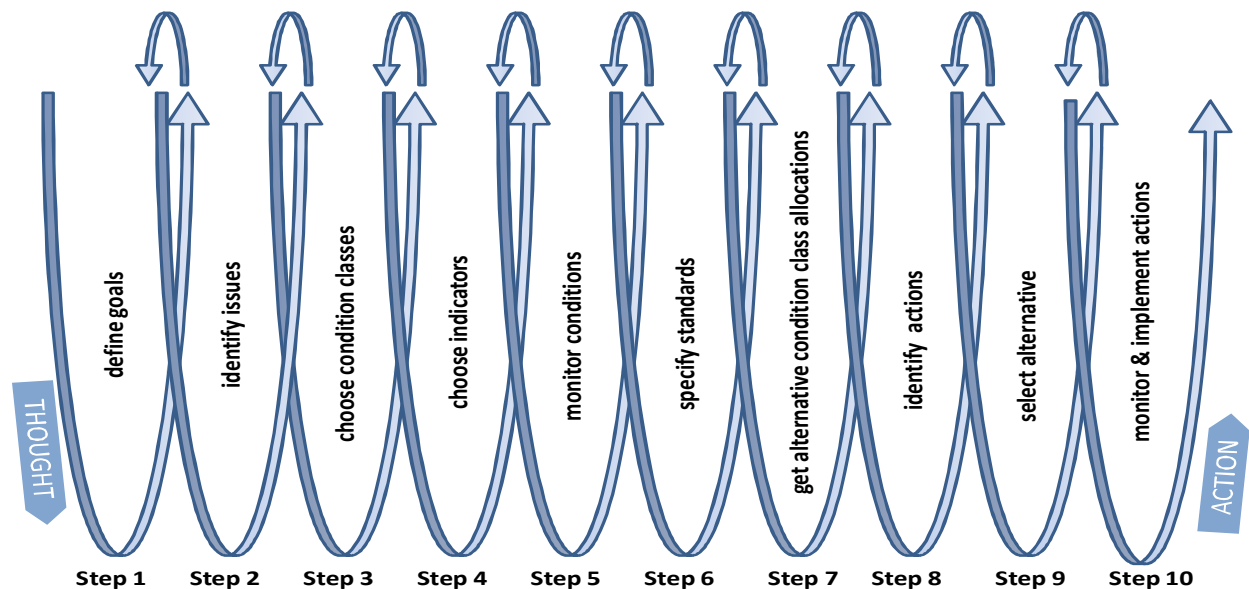
These aspects point to the application of an “action research” methodology involving a dynamic interplay between thought and action where “a group of people identify a problem, do something to resolve it, see how successful their efforts were, and if not satisfied, try again” (O’Brian, 1998, Pg 3). This cyclical progression of thought and action is represented by Figure 5 below.

**Figure 5 – Simple Action Research Model**



This basic format has innumerable fleshed out version with specific adaptations. In reviewing these for the implementation of a planning and management system for the Imfolozi Wilderness Area, cognizance had to be taken of the policy stipulating the use of the LAC process (see Figure 4). Whilst the policy does not say how rigidly LAC was to be used and to what degree the process could be modified, one can imagine that the 10 steps of the LAC process could be subjected to loops of thought and action, depicted in the Figure 6 below.

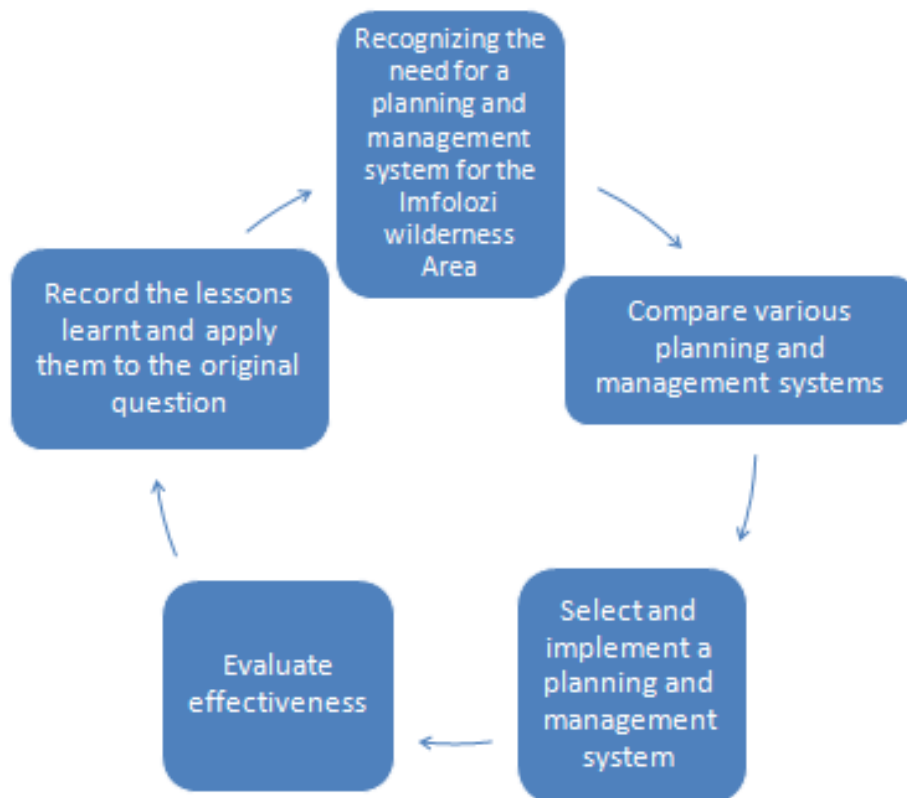
**Figure 6 - The LAC Process in the context of Action Research Methodology showing the interplay between thought and action**



Of course, the cyclical progressions of an action research process are more complex than just thinking and doing; each cycle can be structured in such a way as to emphasize certain phases or

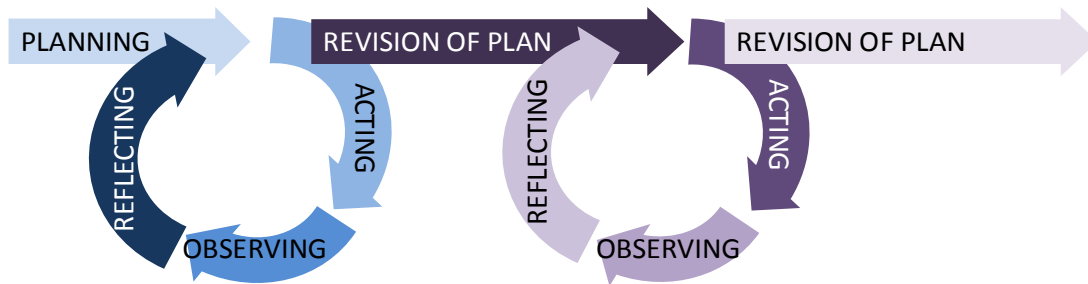
aspects of the cycles. For example, a model described by Susman (1983 in O'Brian, 1998), pictured below in Figure 7, describes the overall process of selecting and implementing a planning and management system for the Imfolozi Wilderness Area.

**Figure 7 - Susman's 5-Phase Action Research Model (1983)**



But to describe the cyclical interplay between thought and action within the implementation process, the four phase cycle described by Kemmis and McTaggart (1988 in Seymour-Rolls et al, 1995) could guide the process of applying the LAC steps, as illustrated below in Figure 8.

**Figure 8 – Showing the cyclical nature of action research (Kemmis and McTaggart, 1988)**



At a very early stage this proved problematic, for whilst these cycles were focusing on a specific step, the LAC process as a whole was determining the general direction. As a consequence, the park management team was using that direction to anticipate the endpoint of the entire project and using that thinking to direct thought and actions within the cycles of the individual LAC steps (see section 3.3.2). The danger in this was not only to undermine the value that the individual steps might deliver, but it could also have resulted in lip-service being paid to the consultation process of LAC (steps two and seven) because of a predetermined vision of the management team.

Salvation from this fate could come from a model that precipitates deeper questioning into the various issues resulting in:

- Finding new solutions as a consequence of deeper probing and more inclusive examining.
- Recognizing and releasing inappropriate procedures currently in use.

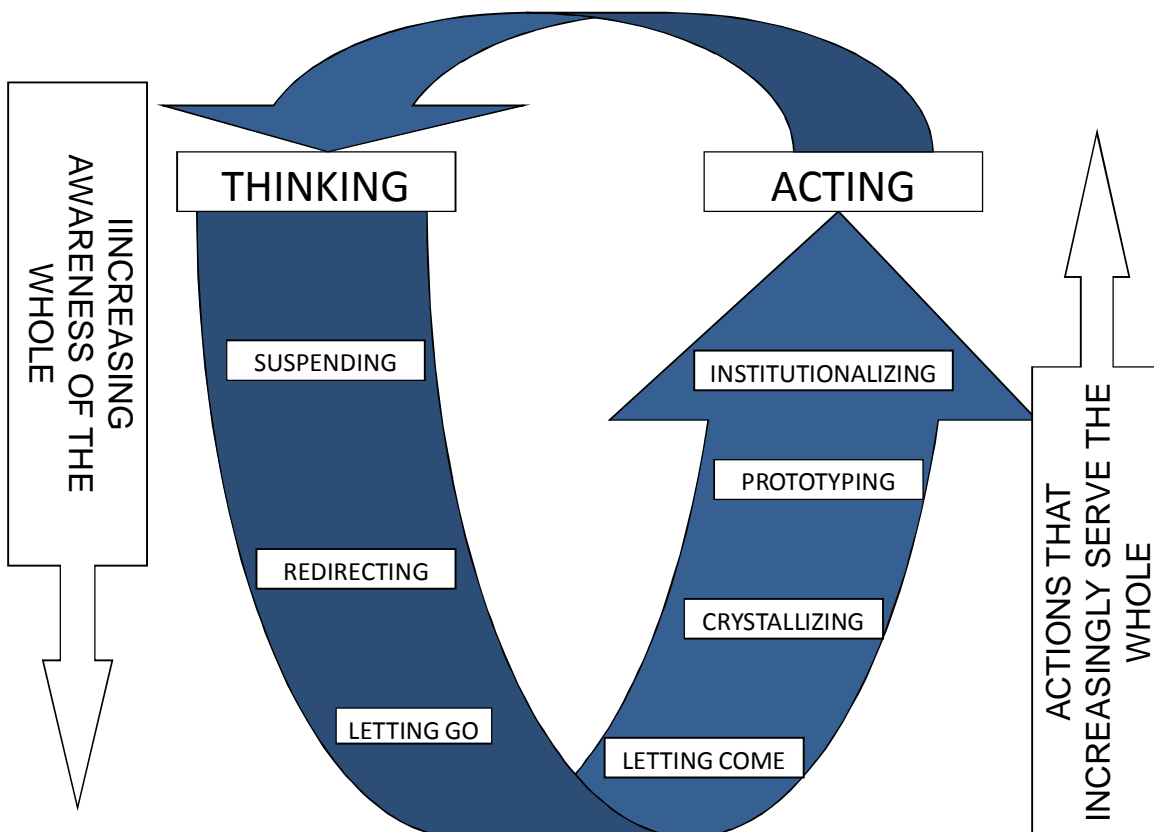
The inclusion of such steps into a methodology exposes in sharp relief two insecurities that action research can induce:

1. Probing and inclusion would expose biases, agendas and intentions of all concerned including the management team (and its researcher). Indeed, the very nature of action research means that the management team and stakeholders are all co-researchers and subjects of the same process and that the resultant collaboration is an essential part of action research (Kemmis and McTaggart, 1988 in Seymour-Rolls et al, 1995).

2. The intention of incorporating diverse viewpoints within the research process meant that the endpoint of that process would be uncertain; for an organisation epitomized by command and control management (see Section 2.4.1), that requires a progressive commitment.

Senge *et al* (2004) suggest a process for intensifying the cycle of thinking and acting (See figure 9)

**Figure 9– The capacities of the U-Curve (taken from Senge *et al* 2004, Pg 11 and 219)**



The U-curve can be seen as a mechanism for institutionalizing systems thinking, described in the *Learning Organizations* model (Senge *et al*, 1994), that replaces Cartesian reductionism and philosophical analysis to concentrate on the dynamic linkages and connecting forces within and between systems rather than the forms of the constituent parts. By releasing concentration of the individual tasks or objectives and opening an awareness such that one is “seeing from the

whole”, then the actions that come out of such thought have applicability to the whole and not just to one aspect of the implementation process (Senge *et al*, 2004, Pg 45). If these actions are employed for the starting point of the next thinking phase, it becomes difficult to anticipate the final outcome and, indeed, unnecessary where the participants/researchers trust the process.

### **3. 1.3 - Research Techniques and Measurement**

An action research methodology was applied to the ten-step LAC process where the various steps were approached using the U-curve. That process is recorded with a descriptive narrative of the implementation process, but with each step producing a definitive outcome in accordance with the process (recorded in Chapter 4 – Results) Whilst the narrative serves an end itself, for the story of implementing LAC in the Imfolozi Wilderness may be valuable to managers of other wilderness areas, it also acts as the glue between the theoretical planning process and the results.

The desired outcome of the LAC process is the establishment of a management system for the Imfolozi wilderness area that:

- Dovetails with the requirements of legislation and Ezemvelo KZN Wildlife policy.
- Creates the opportunity for ongoing stakeholder participation.
- Takes cognizance of the diverse objectives for the wilderness area.
- Results in a functional zonation system that delineates the levels of acceptable human impact for the various zones.
- Results in an adaptable, refined and inclusive monitoring system for human impact on the wilderness area.

The call for a review of Wilderness Area Management Plan (Ezemvelo KZN Wildlife, 2006) was motivated for a number of reasons; whilst the document had served a pioneering purpose in South African wilderness conservation, it contained faults that required addressing:

- It was largely unreferenced.
- It contained writing that had been cut and pasted out of textbooks and coursework manuals.



- Without monitoring before the establishment of standards, the limitations on human activity, listed in the Wilderness Area Management Plan, were determined by estimations of the management team.
- The limits were not written so that they could tie in to the IMP or legislation.
- The lines delineating zonation were difficult to determine on the ground and had not been determined using any derivation of the LAC process.

### **3.2 – THE FIRST STEPS**

The management team had realized that the very manner in which the wilderness area is planned and managed required revision (Ezemvelo KZN Wildlife, 2006) and that in keeping with the current Ezemvelo KZN Wildlife policy (1999) on wilderness management, that system should be LAC. The Wilderness Management Plan provides an abbreviated explanation of LAC (Ezemvelo KZN Wildlife, 2000), specifying areas of applicability and goes on to recommend that research be done into the application of LAC. It was agreed that it was necessary to conduct a research project into the monitoring and management of the Imfolozi Wilderness Area as the first step in reviewing the Wilderness Management Plan. It was determined that the research process would involve close collaboration between the researcher and the management team and that the importance of that relationship could not be under estimated. This was the case in the first complete implementation of LAC in the Bob Marshall Wilderness Complex where it too resembled an action research project with a dynamic interplay between learning and action (Warren, 1997 and McCool and Cole, 1997). For the purpose of this dissertation the term *project management team* refers to the group made up of Conservation Manager, the three Imfolozi Section Rangers and the author. The first task of the project was to review management histories in other wilderness areas and also to determine the appropriateness of LAC as a management tool. The outcome of this enquiry makes up the bulk of the literature review.

During a meeting with the conservation manager of Imfolozi in early May 2006, three points were established:

- The Park Manager was not interested in a small test scenario where the limits of acceptable change process would be applied to a few selected situations and then applied more broadly later on; he was eager to apply the management system broadly from the outset.
- He was eager that the management system be applied not only to recreational impacts of wilderness but management activities as well; in some respects these represented some of the most significant impacts and generated the greatest potential for conflict.
- It was evident that the criteria determining the applicability of the LAC process (namely conflicting goals, the capacity for compromise, a hierarchy of goals and the presence of measurable and attainable standards – Cole and McCool, 1997b) were all present in the Imfolozi, so much so that LAC should be applied in its entirety with particular attention being paid to the collaborative steps of two and seven (see flowchart figure 4).

This effectively doubled the size of the project and converted it from an hypothetical investigation to an action research application.

In August 2006, the Section Ranger at Makhamisa, Paul Harvemann, had taken a position in Mkuze Game Reserve. It took four months to replace his post. The core of the management team consists of a Conservation Manager and the three Section Rangers for Imfolozi. One Section Ranger represents a significant proportion of the management team, added to which the particular post that had to be filled covered the largest proportion of the wilderness area, Makhamisa. Consequently, the meeting that should have taken place at the end of July 2006 was delayed until the 20<sup>th</sup> of November 2006. It was conducted as an informal discussion and focused on three issues:

- The need for the research project to be conducted and implemented at that time, necessitated by the Protected Areas Act (2003).
- The respective roles of the Conservation Manager, Section Rangers and researcher.
- The comparative advantages of different planning, monitoring and management systems.

Acknowledging that the Ezemvelo KZN Wildlife policy refers specifically to LAC, there was much discussion as to how much latitude could be sought if the circumstances in Imfolozi necessitated borrowing aspects of alternative planning and monitoring strategies. Whilst it was

agreed that an unabbreviated application of LAC would best suit the diverse objectives of Imfolozi, two lessons could be extracted from other models:

1. From the application of the Wilderness Inventory and Monitoring System (WIMS) in the Yosemite National Park, one of their clear lessons is to start collecting and recording the baseline conditions early on and do so in a manner that useful data can be extracted over time (Boyers *et al*, 2000). This is particularly pertinent when LAC is used as the primary planning tool, because it intentionally refines the monitoring process, and does so by focusing on issues that have arisen between stakeholders. But some issues will only arise in 10 years time, and there may not be baseline data for comparison.
2. The project management team was concerned about how human impacts were to be isolated in an environment that is so heavily impacted upon by animals. A rigidly applied LAC process, where indicators are selected first and then monitoring conducted around those indicators, was considered too uni-directional. The VERP process describes a dynamic inter-play between the various steps (see Table 4 in Section 2.4.1), and this was considered appropriate for steps four and five (described in Section 3.8).

It was agreed that the parts of LAC that specifically involved broader participation were Step 2 (when differing objectives issues and concerns are recorded) and Step 7 where interested people or groups submit their preferred zonation allocations (see Figure 4). Three thoughts came out of the discussion:

1. An explanation of the LAC process should be included in the IMP before it goes out for public comment.
2. If the IMP process were delayed and Step 2 occurred prior to public comment, justification for proceeding with LAC would stem from the Ezemvelo KZN Wildlife Board policy for wilderness. If that was to be the case, then the management team must make every effort to ensure that groups with conflicting interests or objectives pertaining to the wilderness area are involved in Step 2.
3. Step 7 should, in theory, include all the IMP stakeholders but again, primary significance is given to those persons or groups with conflicting objectives.

It was at this juncture that it became apparent that the management team had a very fixed outcome in mind. Not only that, but it was also clear that the management team did not have unlimited time for this project. It was also clear that the researcher's role was to navigate the process through the two phases of conflict-filled stakeholder participation, to the promised land of the management team's initial vision. The unreasonable pressure of this task precipitated the deepening of the action research methodology to include the U-curve (Senge *et al*, 2004) with particular emphasis on releasing preconceived or outdated thinking before it is transferred into inappropriate action. The introduction of this thinking into wilderness management issues was subtly introduced without even mentioning the U-curve. Very gradually, the project management team came to realize that it was implementing "a process, not necessarily a product" (McCool and Cole, 1997, Pg 77) without a preconceived endpoint or result. Furthermore, if attention was paid to implementing a sound process, one that invited broad consultation without abandoning accountability, then the most appropriate outcome would emerge or evolve out of that process.

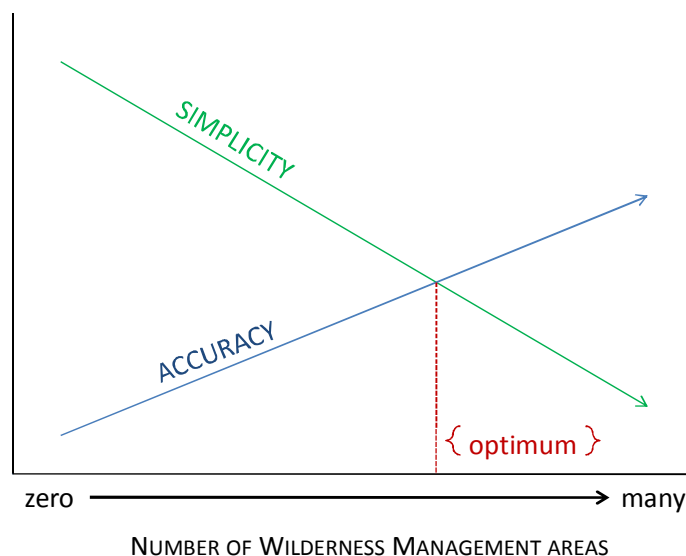
### **3.3 – THE DIVISION OF THE IMFOLOZI WILDERNESS AREA INTO MANAGEMENT BLOCKS OR WILDERNESS MANAGEMENT AREAS**

A useful prequel to the implementation of the LAC process involved the division of the area in order to spatially describe and organize management and recreational activities (Cole and Stankey, 1997). In the past, there had been many divisions of the wilderness area; its original zonation (Ezemvelo KZN Wildlife, 1994) into pristine, primitive, semi-primitive non-motorised and semi-primitive motorized (Ezemvelo KZN Wildlife vehicles only) was conducted as a desk-top study by the knowledgeable field staff. The boundaries of the pristine area were especially difficult to distinguish on the ground. There have also been maps delineating trail usage, rhino capture and management divisions. The purpose of another geographical division of the wilderness area was not necessarily to amalgamate previous divisions, but rather to provide a means of managing a wide range of human activities in such a way that social and resource conditions could be monitored and maintained.

A number of principles had to govern the process of determining the establishment of the *Wilderness Management Areas* (WMAs):

1. The standards that were to be written later in the process (Step 6) would need to apply to an entire management area. In other words, a management area could not be described as being half primitive and half pristine within the LAC system. In that instance, it would be better for the management area to have been divided in two. (Cole, 2007)
2. The above situation begs the question – how big should the management areas be and how many should the Imfolozi Wilderness Area have? Obviously a large number of management areas dividing up the wilderness implies that the management areas will be smaller. As a principle, precision and complexity will increase with an increased number of management areas. The decision, then, on how many WMAs to have is based on balancing accuracy and simplicity. It would be of no use to have an incredibly accurate management system that is too complicated to use on the ground and similarly a user-friendly management system that provides meaningless results would be worthless. The aim is to find the optimal number of divisions defined by the two opposing trends of accuracy and simplicity, as depicted below in figure 10.

**Figure 10 – Illustrating the how the relationship between simplicity and accuracy effects the determination of the number of Wilderness Management Areas for the implementations of LAC**



3. Wherever possible, discernible geographical features should be used to delineate WMA boundaries. Ridge tops would be preferred over rivers, primarily to aid in enhancing opportunities for solitude on wilderness trails; if the river were used as a dividing line between two areas, it would be possible that different trail parties operating in adjacent WMAs could view one other across a valley.

Understanding these principles was the first step in demarcating the WMAs in Imfolozi. The next step was to apply these principles and to draw some possible options on a map, taking cognizance of topography and current human usage. Initially, this involved some very crude guesswork because the data on human impact had not yet been gathered.

If ridge tops were used as the primary means of dividing the WMAs, the options as to where the dividing lines go are considerably reduced and so the first draft map of the WMA boundaries was produced. It was then necessary to determine how functional these boundaries would be to people on the ground: would trails guides and Field Rangers be able to determine the whereabouts of the WMA boundaries? To ascertain this, a trip was organized with the specific objective of examining potential boundary lines between WMAs. This was completed with the help of five volunteers between the 31<sup>st</sup> October and the 9th of November 2006. It started on the eastern boundary of the park at Siyambeni and ended 10 days later, on the western boundary at Nqolothi. The group received one re-ration of food from the Makhamisa Outpost on the fourth day.

The exercise revealed or confirmed a number of findings:

1. That whilst most ridge tops have animal paths on them, very rarely do they occupy the apex of the ridge. Nevertheless, they serve as very useful markers. Some old paths, which had been converted into vehicle tracks prior to 1957, were still visible. Most of these were closed after the formation of the wilderness area, but some received occasional use for game capture after the formation of the wilderness area or for the culling exercise in the early 1980s. With the exception of small localized shifts to accommodate fallen trees or erosion, the paths appeared to have retained their positions;

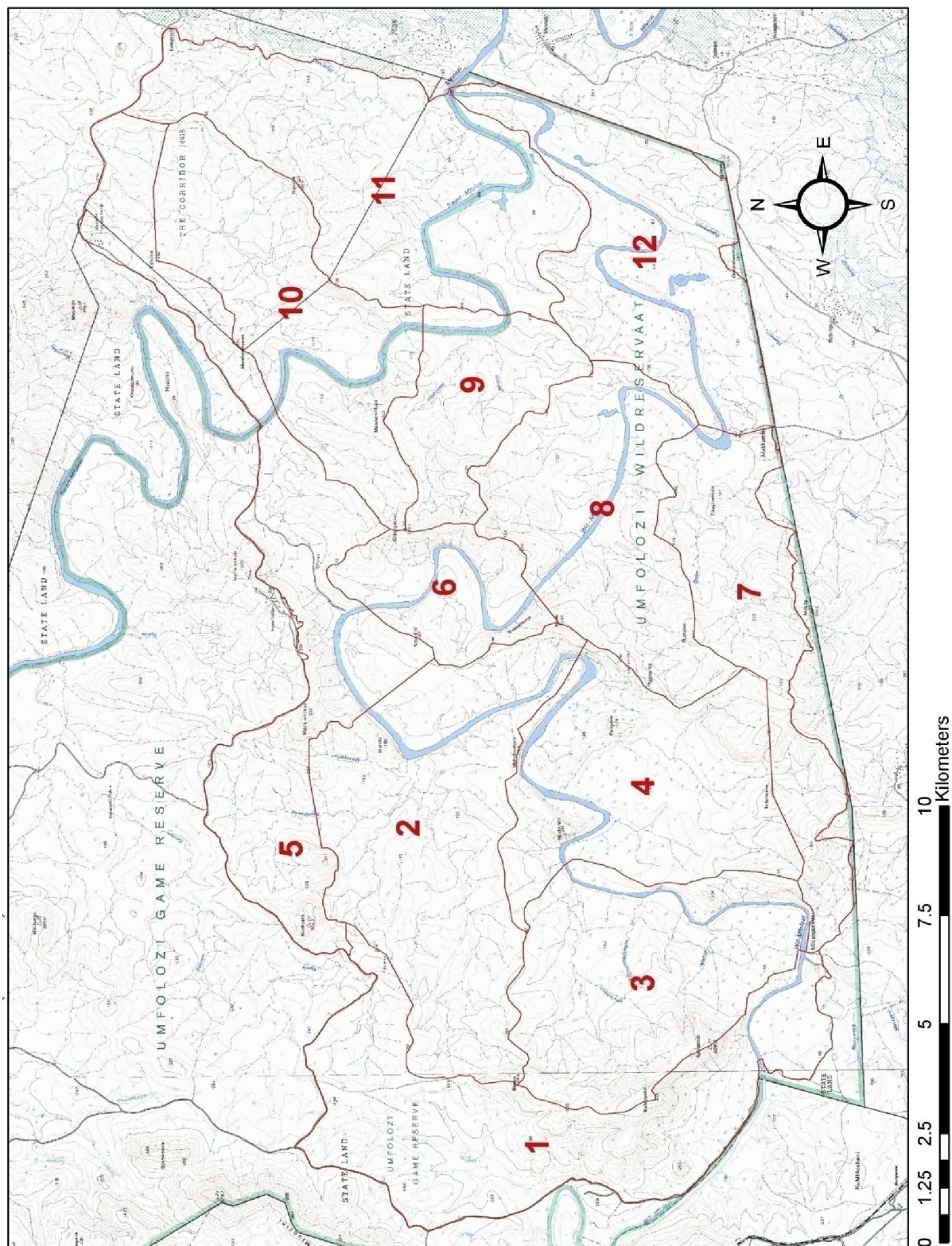
evidence for this could be seen in that current paths seldom deviated from the historic tree-cleared vehicular routes, which in many cases are still discernible.

2. There was concern that some of the WMA boundaries would cross thick vegetation and whilst this proved to be correct, the concern proved to be unfounded, for one of two reasons: firstly, if the boundary were the apex of a ridge, the direction of the slope would be able to inform the observer which WMA they were in, even in thick vegetation. Secondly, patches of seemingly impenetrable vegetation almost always have a path traversing them. It should be said, however, that finding these paths requires familiarity with the region. For example, if the area exhibits current signs of a territorial white rhino bull, one could expect to find a path linking the grazing area to water. (This presupposes that the observer will be able to recognize an area with a resident bull and be able to differentiate between habitually used rhino paths and other animal paths.) Such paths are regularly used on wilderness trails. If one of the purposes of the WMAs is to delineate between trail areas, it would make sense to use the ridge top as a boundary rather than a nearby path off the ridge; if a path were the boundary, a trail party would effectively be occupying two WMAs simultaneously. This would defeat one of the purposes of the divisions.
3. In a number of instances, three or more Wilderness Management Areas would meet a particular point. In some instances these points would be topographically and visually distinct, like the top of Dengezi which is the juncture of WMAs 6, 9, and 10 (see Figure 11). But others were less clear, like the juncture of WMAs 9, 11 and 12 at Siwasomsasane. Such areas were visited, described and recorded.

As a principle, the WMA boundaries could be refined and modified up until the point where zonation categories were being allocated to the different WMAs. The project management team made use of this principle so that the final boundaries were fixed just prior to Step 7, in November 2008. Figure 11 below depicts those boundaries.



**Figure 11 – The Imfolozi Wilderness Area showing the division of the Wilderness Management Areas (WMAs)**





### **3.4 – STEP 1 – PLANNING GOALS**

The purpose of this step is to focus the management intentions by collating the mandates that point out the purpose for protection and outline the areas uniqueness or niche (Cole and McCool, 1997a). An opening acknowledgement of the step is that the goals of wilderness areas generally, and specifically those of Imfolozi, are changing: the romanticized notion of an ever unpopulated Imfolozi Wilderness being preserved as an historic relic for the benefit of future generations of human holidaymakers is losing value. In its stead, four trends are emerging.

#### **1. The value of wilderness to biodiversity conservation.**

It is important for signatory nations of the Convention on Biological Diversity (See Section 2.2.4) to recognize and legislate protected areas that are representative of existing ecosystems, especially those that may contain threatened or endangered plant and animal species (Mkhize, 2009). The Hluhluwe-Imfolozi Park hosts important endemic and endangered species. Allotting a portion of it as wilderness, where that area will be managed by minimizing human intervention, is indicative of the country's commitment to the CBD (Mkhize, 2009).

#### **2. The role of wilderness in shifting human consciousness.**

Shifting human consciousness is the primary motive behind wilderness trails in Imfolozi. Initiated by Ian Player in 1957 (Player, 1979), trails have been run by Ezemvelo KZN Wildlife (or the Natal Parks Board prior to amalgamation), and the Wilderness Leadership School (an NGO). Both organizations accept the profound effect wilderness can have on people. It is also true that the staff who lead the trails have a profound effect on the outcome. Both organizations have had staff and infra-structure that enhance people's experience of wilderness, and both organizations have endured periods in which the primary motive of reconnecting participants with the natural world was usurped by commercial or political agendas. In spite of these often sanctioned distractions, the process of facilitating trails has evolved to a refined degree. Current thinking suggests that people who are at the coalface of the impending environmental crisis (often epitomized by the extreme ends of the haves/have-nots continuum) are actively seeking new environmental solutions, but doing so without ever having been connected with the wilderness condition, out of which human society originally evolved (Nash, 1982). Timely

rectification of that situation, by immersing those solution seekers in a large natural area devoid of human distraction (wilderness), can result in the kind of problem-solving advocated by Senge *et al* (2004) where solutions emanate from the whole self and not merely the intellect. Intuitive creativity is awakened, along with an innate comprehension of humanity's interconnectedness with the environment. Skilled trail leaders can contextualize the experience so that it retains behaviourally transformative value long after participants have returned to their various social settings.

### **3. The extrinsic goals of wilderness**

If wilderness is perceived as having value (which may be mysterious or unshared), then its value can be transferred into economic wealth. Such wealth could be extricated through ecotourism or merely by receiving compensation for its retention as wilderness.

### **4. Goals that make use of the word *wilderness***

Retain the term *wilderness* but re-define it from a local perspective to suit local conditions. Such re-definition could include the use of vehicles or high impact management strategies necessitated by conditions which only local residents or managers can understand. Remoteness or political hesitance to oppose such re-definition allows this philosophy to persist.

To summarize, there is polarity between the four emerging goals, with biodiversity and the changing of human consciousness views on the one hand, and the exploitative/insular views on the other. The significance of these emerging values is that all of the laws and regulations that will apply to the wilderness area have or will be subject to interpretation and adaptation as a result of public scrutiny and comment. With this in mind, a list of laws, policies, regulations and other documents potentially affecting the parameters of wilderness management in Imfolozi, were tabled; these documents effectively define and refine the mandate for the wilderness area of Imfolozi and are listed in Table 15 in Section 4.1.

### **3.5 – STEP 2 - IDENTIFYING AREA ISSUES AND CONCERNS**

The primary purpose of this step is to gather information pertaining to the uniqueness and value of the Imfolozi Wilderness Area from the very people who attribute the area with those values. By requesting input regarding people's perceived objectives for the wilderness area, as well as the issues or concerns they may have, the project management team would be able to direct management emphasis of the LAC process in those directions.

But there is a second very useful purpose to Step 2: by collecting the diverse views of those people who are associated with the wilderness area, it would be possible to ascertain if some of those views conflicted. For example, scientists involved in priority species conservation may wish to minimize human disturbance to denning wild dogs and this may conflict with staff in charge of environmental education, who wish to expose as many people as possible to the Imfolozi Wilderness.

The importance of ascertaining the existence of conflicting objectives cannot be underestimated for, as mentioned in the literature review (Section 2.5.1), such conflict is a pre-requisite for the implementation of LAC. Step 2, then, provides early confirmation that the management team has selected the right tool. By interacting with the various wilderness users, it is also possible to confirm that the various stances held have flexibility to accommodate alternative stances of other wilderness users, another pre-requisite for LAC (Cole and McCool, 1997b).

The project management team decided to tackle Step 2 by holding a workshop. The first task was to decide who to invite. Ideally, a list could have been drawn from the stakeholders of the IMP, but that process was far from complete. So the list was drawn up specifically for workshop with two principles in mind:

1. The list should include all those who have direct involvement or vested interest in the wilderness area of Imfolozi.
2. It must represent the diverse interests of stakeholders, especially those that may conflict with others.

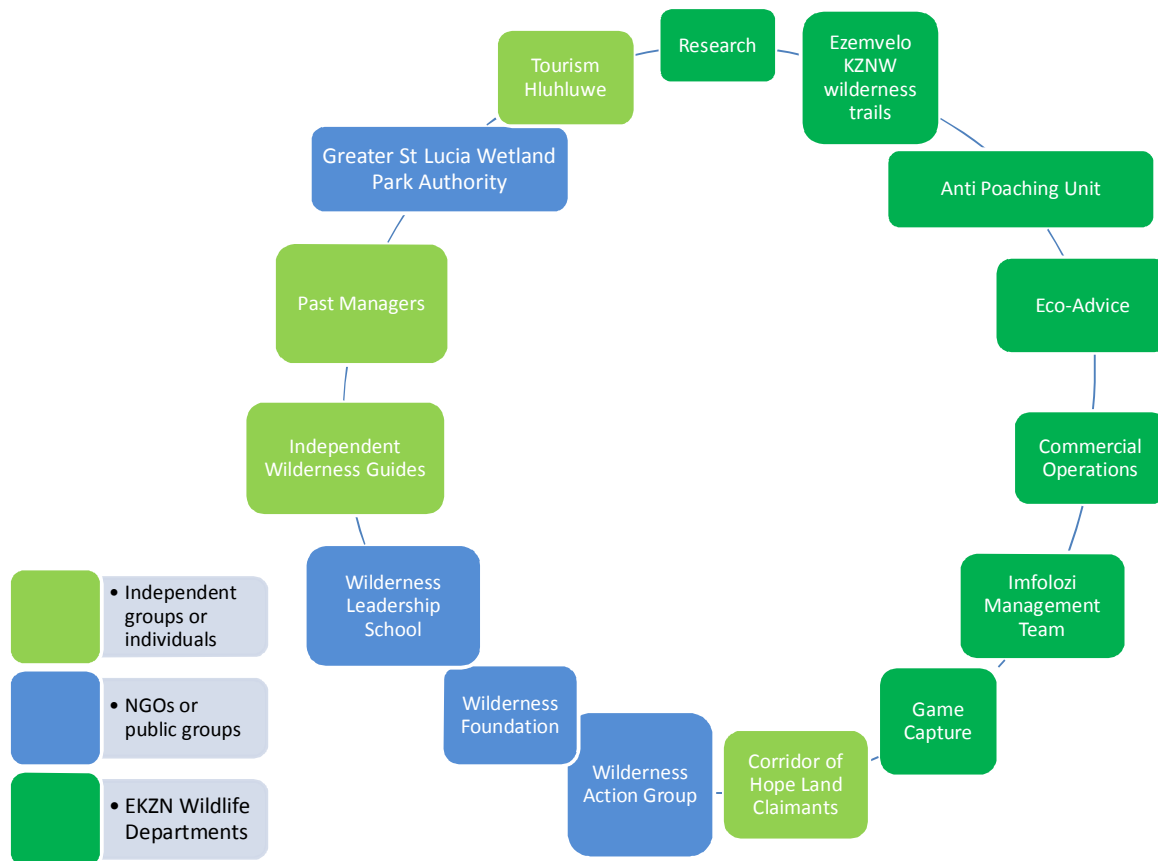
The invitation list included:

- Local communities represented by the local board members.
- The Corridor of Hope Land Claimant Group.
- The Wilderness Action Group.
- The Greater St Lucia Wetland Park Authority.
- The Wildlife and Environment Society of South Africa (WESSA).
- The Game Rangers Association of Africa.
- The Wilderness Leadership School.
- The Wilderness Foundation.
- Previous managers and trails staff.
- The following Ezemvelo KZN Wildlife Departments:
  - Game Capture
  - Trails
  - Commercial Operations
  - Planning
  - Research
- The following Ezemvelo KZN Wildlife staff from the region:
  - General Manager (Zululand)
  - The Biodiversity Conservation Coordinator
  - The Conservation Manager (Hluhluwe)
  - The Section Rangers (Hluhluwe-Imfolozi)

Invitations to participate in the workshop and an information pack summarizing the entire LAC process were sent out by the Conservation Manager. Invitations, sent by either e-mail or post, were followed up by phone calls.

The workshop was attended by 27 participants; Figure 12 illustrates the organizations, Ezemvelo KZN Wildlife Departments and individuals who were represented.

**Figure 12 - Illustrating the Organizations, Ezemvelo KZN Wildlife Departments and individuals represented at the LAC Step 2 Workshop**



The workshop opened with its context being explained to participants. This involved explaining the LAC process itself, how it works and how it would apply to the wilderness area of Imfolozi. The primary purpose of explaining the context of the workshop was to inform those who were wanting to provide input, so that they would be able to refine their submissions to ensure that the project management team would be able to correctly interpret and include the input in subsequent steps.

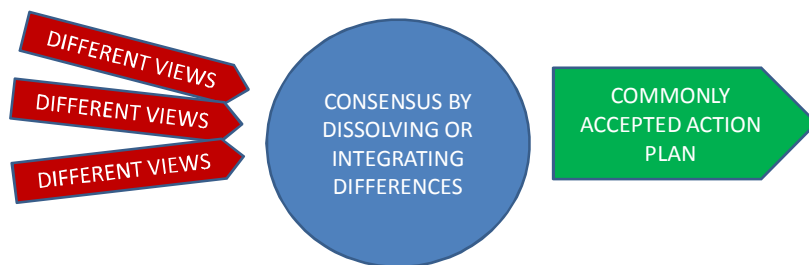
But there was a second advantage to explaining the LAC process at the workshop, which was not immediately apparent. There has been considerable debate and conflict over the management of the wilderness area and the restrictions that accompany such designation. For example:

- Conflict between public and trails officers/guides regarding how one may behave in the wilderness area.
- Conflict between trails officers and management regarding the minimum tool and exceptions to wilderness principles.
- Conflict between trails officers/guides and game capture officers regarding disturbance to trail participants.
- Conflict between game capture and management regarding areas for capture.
- Conflict between management and tourism regarding lack of access.
- Conflict between park authorities and communities regarding access and compensation.

The explanation of the LAC process removed any preconceptions that this was the management team's attempt to impose its will. The subsequent co-operation that the project management team received from all users during the monitoring phase (Step 5 of LAC) indicated that some trust had been placed in the process of LAC to produce a dynamic, collaboratively sought after outcome to which the management team is accountable, resulting in reasonable and defensible decisions being made in a transparent manner. Broad acceptance of that LAC process became a crucial point of consensus as a meta-narrative solution (see figure 13 below).

**Figure 13 - The emergence of consensus initiated by the LAC Step 2 Workshop**

What is possible in situations where LAC is not applicable



What emerged at the Step 2 Workshop



Following the explanation of the LAC process, the participative part of the workshop was facilitated in the following way:

- A brief overview of the procedure was provided, including time frames, the use of small groups, the recording of input and desired outcomes.
- It was explained that the project management team was seeking to gain knowledge about how people view the wilderness area of Imfolozi in order to determine their objectives in having a wilderness area. It was stressed that these objectives did not need to be all-encompassing but rather to emanate from their particular stand point, justifying their particular wants or uses of the area. Participants were also asked to list issues and concerns that might arise as a result of their or other users' emphases.
- Participants were invited to form themselves into small groups of their choosing. After discussion, they could provide input either as individuals or as a group.
- Using marker pens and different colour paper for objectives, issues and concerns, the participants recorded their input, one item (objective, issue or concern) per page. By putting their name or group on each page, the origins of the input could be recorded. Participants could rank their various points as being of high medium or low importance.
- A final plenary session was held where the small groups presented their input verbally, whilst their colour coded written submissions were pinned up on the walls.
- With discussion, the various submissions were then grouped where there was overlap.
- Finally, the input was recorded verbatim and tabled. They appear in Tables, 16, 17 and 18 in Section 4.2.

It is worth noting that the input received from participants was not only diverse but in some cases contradictory and conflicting. This provides confirmation the LAC process is the correct management tool.

### **3.6 – STEP 3 - THE DEFINITION AND DESCRIPTION THE ZONATION CATEGORIES**

Whilst Steps 2 and 7 of the LAC process specifically involve input from a wide range of people, all the Steps (even those that are mandated specifically to the management team) should be open to all. The expectation of the project management team was that these meetings would involve a lot of people with diverse thoughts. The correct tool to capitalize on such diversity would be the *search conference* where participants could lock themselves away for a few days, preferably somewhere in the wilderness area, to:

- List issues.
- Discuss issues.
- Contextualize issues.
- Envisage a “desirable future”.
- Consider actions (Trist, 1979 in O’Brian, 1998).

Consequently, mini-workshops were envisaged for Steps 3, 6 and 8 of LAC. They were never to happen. Initially, the management team agreed to the idea of a number of mini-workshops, but in reality, the pressures of managing a park did not allow for it. From the Section Rangers perspective, it is very difficult to anticipate with any accuracy what he/she will be doing more than a few hours in advance. A poaching incident or a large animal break-out of the park will often interfere with long held plans for meetings, workshops or other arrangements requiring forethought. Each of the three mini-workshops (Steps 3, 6, and 8) were reduced to single day meetings, and even for those it was hard enough just to assemble the core of the management team (the Conservation Manager and Section Rangers). Four possible reasons contributed to poor attendance of people other than the project management team. Firstly, meeting dates of the management team were often changed at the last minute to accommodate Section Ranger activities. Secondly, middle managers from other departments of Ezemvelo KZN Wildlife have to attend many meetings so that they may be reluctant to attend those that are not mandatory. Thirdly, the remoteness of Imfolozi makes it difficult for people to attend meetings. Lastly, for some people the process was considered to be in good hands and, as such, the project management team should be left to carry on.



The meeting for Step 3 took place on the 31<sup>st</sup> of May 2007. The purpose of the meeting was to select and describe the zonation categories or *opportunity classes* that were appropriate to the Imfolozi Wilderness Area.

Making use of Clark and Stankey's work (1979) and Buist *et al* (1982), the history of the Recreation Opportunity Spectrum (ROS) was outlined, as well as its inclusion into the LAC process at the Bob Marshall Wilderness Complex. The project management team then examined the zonation categories that were currently used in the Imfolozi Wilderness Management Plan and compared them to those used in the uKhahlamba-Drakensberg Park (Ezemvelo KZN Wildlife, 2005b).

From here, the discussion focused on three case studies which involved the application of ROS. The case studies, listed below were selected to highlight different aspects of the ROS system that may have relevance to the situation in Imfolozi:

- The ROS application in the wilderness areas of Wenatchee National Forest in Washington State was examined for the zonation categories that were selected (pristine to transitional) as well as for the manner in which those zonation categories were described in terms of local conditions (Arthur Carhart National Wilderness Training Center, undated).
- The case study of Hells Canyon Wilderness Area on the Oregon/Idaho border was scrutinized because the area is large and remote and therefore represents the wilder end of the spectrum. Zonation categories specifically mention wildlife disturbance as an issue (US Forest Service, 2003).
- The Midewin National Tall Grass Prairie in Illinois was selected as a case study because it is a relatively small area (7000 ha), which is being restored and is currently represented by rural to semi-primitive zonation categories within the ROS spectrum (Midewin National Tallgrass Prairie Plan, 2002).

These case studies were used to expand the project management team's knowledge of the ROS system so that its applicability to the Imfolozi Wilderness could be envisaged. Two guiding principles were identified:

- The zonation categories selected for Imfolozi should reflect similar degrees of wildness in other management planning systems.
- Objectives, issues and concerns recorded at the Step 2 Workshop would affect the zonation categories that we would select. These pointed to the inclusion of stricter zonation categories to preserve and enhance the areas naturalness and/or wildness. There were a number of discussion points which are listed below in Table 6.

**Table 6 - Discussion points and principles from the Step 3 meeting**

<b>Discussion points</b>	<b>Principles to guide the outcomes-</b> quoted verbatim from the summary of the meeting (Ezemvelo KZN Wildlife, 2007b, Pg 1 and 2)
Desired Future Conditions	The principle of Desired Future Conditions should be used when describing the nature of opportunity classes (zonation categories).
The area's wildness	The perception of wildness is present across the wilderness area.
Visible human impacts	The significance of a disturbed, modified or inhabited view shed in some parts of the wilderness area is mitigated by other properties of wilderness.
Use of the term <i>de facto</i> wilderness	There is a sense of remoteness, which justifies <i>de facto</i> wilderness classification.
Use of the zonation category -Pristine	From a perceptual perspective, the small size of the iMfolozi Wilderness is mitigated by the presence of potentially dangerous animals. The increased sense of wildness as a consequence of those animals justifies the category of Pristine.
Appropriate categories	The categories of Pristine, Primitive and Semi-Primitive are appropriate, from social and biophysical perspectives, in comparison to other wildernesses.
Minimum impact camping	Visitor use (wilderness trails) is overseen by management-approved wilderness guides and consequently there are fewer visible signs of human impact than in other wilderness areas (in all opportunity classes/ zonation categories). This principle should be continued and encouraged.
Encounters with other groups of people	Through management of visitors to the iMfolozi Wilderness, encounters between trail groups are already minimized beyond comparison. This principle should be continued and encouraged.

The outcomes of the Step 3 meeting, including the zonation categories and their descriptions for the Imfolozi Wilderness Area, appear in Table 19 in Section 4.3.

### **3.7 – STEPS 4 AND 5 – THE SELECTION OF INDICATORS AND THE MONITORING OF CONDITIONS**

From the outset, the project management team realized that the selection of indicators of human impact (Step 4 of LAC) was going to be challenging (referred to in Section 3.2) because there has not been an application of LAC in a geographically or ecologically similar area. So Step 4 was going to require innovation because the indicators used in many previous studies (for example, path compaction, damage to vegetation and firewood depletion) may be skewed by features of Imfolozi; human impact on paths is difficult to distinguish in a park with 3000 buffalo and 2000 rhino; human damage to vegetation is hard to notice next to that inflicted by 400 elephants; and firewood depletion is hard to measure in light of the parks fire management policies and the elephants' prodigious production of available dead wood. For this reason, previous work done on the selection of indicators in other wilderness areas has limited applicability.

Originally in the LAC process, the selection of indicators precedes and guides the monitoring phase of Step 5 where an inventory of conditions is conducted. But because of the problems associated with the selection of indicators in Imfolozi, it was decided to deviate from the traditional LAC implementation process: to borrow a principle from the related VERP process and refine the indicators as the monitoring was taking place (as mentioned in Section 3.2).

In keeping with the LAC implementation process (Stankey *et al*, 1985), the starting point was to review the information gathered at the Step 2 Workshop and determine the issues around which the monitoring should be based. This provided an indication about which activities should be scrutinized in the monitoring process and which facets of those activities should be isolated to produce measurable indicators that are preferably quantitative as well as being temporally, financially and practically functional.

The start of this exercise was effectively a mind-mapping exercise conducted by the project management team that produced a long list of indicators with many overlaps. The plan at this point was to become familiar with all the issues and activities that contribute to human impact on the wilderness area, all the while refining the number of indicators down to a manageable

number. This would initially be accomplished by removing overlaps and defining measurable units for the remaining indicators. Then a two phase approach was adopted. This involved observing activities as they took place (where possible) and then returning to the areas where they had taken place to identify isolatable indicators. So, in effect, the initial monitoring, whilst being directed by the activities taking place in the wilderness area and by the issues raised at the May workshop, was taking place without indicators or measurements! It was more a case of observing what was happening, and then using those observations to formulate and refine further monitoring along the lines of definable indicators. With the help of the management team, questions were tackled regarding human influences and impacts:

- Is a particular influence ecologically or aesthetically significant? (In other words, could it be used to develop a *resource* or *social* indicator?)
- What is the perceivable residue that can be measured to record impact and/or recovery?
- Who would do the monitoring on an ongoing basis?
- What skills are required to do this monitoring?
- How much will it cost?

The initial observation phase was applied to four areas of wilderness activity:

- Wilderness Trails (hikes), focusing on the backpacking trails of the Wilderness Leadership School and the Ezemvelo KZN Wildlife (locally referred to as primitive trails), and the conventional trails run by Ezemvelo KZN Wildlife which make use of base camps and satellite camps, where donkeys are used to transport food and clothing.
- Game capture, including the aerial uplift of black rhino in the conventional capture of white and black rhino.
- Influences that emanate from outside the Wilderness area such as alien plants, alien diseases as well as light and noise pollution.
- Management activities including the patrol system, the buffalo tuberculosis (TB) project, culling, lion call-ups, Field Ranger camps, and security.

### **3.7.1 – Wilderness Trails**

Wilderness trails are conducted by a specifically trained section of the Ezemvelo KZN Wildlife staff in Imfolozi and the Wilderness Leadership School, a non-governmental organization (NGO). They were initiated in 1959 by Ian Player in conjunction with the Imfolozi staff (including Magqubu Ntombela, a story teller, wilderness guide, and significantly, Ian Player's long-standing friend). It is also pertinent to mention that whilst the Trail systems of the Ezemvelo KZN Wildlife and the Wilderness Leadership School had the same origin, they evolved down distinctly different routes. The Ezemvelo KZN Wildlife trails (or Natal Parks Board Trails prior to 1998) cater primarily to paying members of the public whilst the Wilderness Leadership School's primary function is to target current and future leaders and to expose them to wilderness (Player, 1979). The Ezemvelo KZN Wildlife trails retained the use of donkeys to transport food and equipment to satellite camps in the wilderness area which, for a time, were fenced to keep lions away from the donkeys (Densham, 2009). The Wilderness Leadership School kept 44 gallon drums sunk into the ground at designated campsites to store their equipment and carried food and clothing into the camps in backpacks (Dell, 2009).

1984 saw two events, of very different magnitude, that were to change Imfolozi's wilderness trail operations. Firstly, Cyclone Demoina scoured out the river catchments of the Black and White Imfolozi Rivers, removing all fixed camps along with about 120 km of riverine fig forest. Secondly, the concept of "minimum impact camping" was introduced by Bruce Dell, who brought the concept back from the United States where he had attended a three-month course with the National Outdoor Leadership School (NOLS). As a contractual trails officer (wilderness guide) with the Wilderness Leadership School, Dell introduced a type of trail without any fixed camps, where groups would find appropriate camping sites at the end of each day. Minimum impact camping is a core component of these trails. Part of his contractual responsibility was to assist in the training of new staff members, one of whom was the author. By 1992, backpacking trails (or primitive trails) became the standard operating procedure of the WLS. Between 1992 and 1994 and as an employee of the WLS, the author took two management staff from the Natal Parks Board on backpacking trails in Imfolozi. This led to a closer interaction between Natal Parks Board and WLS staff and the resurrection of primitive trails which persist within Ezemvelo KZN Wildlife to this day. This background is pertinent for three reasons:

1. The minimum impact camping ethic is a well-established practice in Imfolozi, pre-dating the “Leave No Trace” (LNT) courses by more than 10 years (although it is interesting to note the influence of NOLS on both LNT and the WLS).
2. A gradual inclusion of minimum impact camping skills into the trail systems of the WLS and Natal Parks Board resulted in a high standard of camping so that the delineating measurements of the Frissell Scale had to be modified to register camp activities (Frissell, 1978 and Wadge, 2009). The Wilderness Area Management Plan’s definition of minimum impact camping illustrates the ethical emphasis: “minimum impact camping is a practical manifestation of an environmental ethic, enacted through a set of principles which strives to diminish the effects of outdoor living on the environment” (Cryer, 2001).
3. The Natal Parks Board trail system was seen (in the early 1990s) as a training ground for management staff. It should be noted here that two of the original authors of the Imfolozi Wilderness Area Management Plan were the Conservation Manager, Tony Conway, and Officer in Charge of Trails, Andrew Anderson (both of whom attended wilderness management courses organized by the Wilderness Action Group). Those efforts to advance wilderness conservation have been felt to this day. At the start of this project, the Imfolozi Conservation Manager, two of the three Section Rangers and the head of Game Capture had all led wilderness trails in Imfolozi under the leadership of Conway and Anderson.

The observation of the impact of wilderness trails started with a review of the *wilderness audit* system, focusing attention on what information was being collected and how the information was being used to make management decisions. Existing monitoring methods involved attributing scores based on the appearance of visible residues of camping. Because of the scarcity of quantitative indicators, the subjective judgments (regarding what constituted significant human impact) necessitated continuity of personnel to ensure consistency in successive audits. Subjective judgments were made around two questions:

- Is the current situation acceptable?
- And is the current situation better or worse than last year?

Audits only applied to trails operations and were graded on what was colloquially referred to as the Modified Frissell Scale because it was derived from the work introduced by Sidney Frissell (1978) in the US. The auditing system was first introduced to Imfolozi in 1997 (Natal Parks Board, 1997) and carried out by the Conservation Manager at the time, Mike Wadge. The scale consisted of numbers one to five with specific meanings associated with each number (see table 7).

**Table 7 – The “Modified Frissell Scale” used to measure human impact on camp sites in the Imfolozi Wilderness Area between 1996 and 2008**

<b>Modified Frissell Score</b>	<b>Conditions</b>	<b>Application</b>
<b>1</b>	No bare ground or paths. No visible signs of camping. Acceptable levels of firewood depletion.	Describes acceptable conditions for infrequently used primitive camp sites.
<b>2</b>	Bare kitchen area not exceeding a 7m diameter (increased to 9m in 1997) but no exposed roots. Human made paths visible but no exposed roots. No visible signs at toilet area. Acceptable levels of firewood depletion.	Describes acceptable conditions for frequently used primitive camp sites.
<b>3</b>	Human made paths visible but no exposed roots. Central area, kitchen area, sleeping areas neat but the bare ground may not show exposed roots. Ash pit neat. Shower site neat. Acceptable levels of firewood depletion.	Describes acceptable conditions for satellite camps.
<b>4</b>	Standard exceeded and corrective measures can return conditions to acceptable levels.	Describes correctable satellite or primitive camp sites.
<b>5</b>	Standards exceeded where either corrective measures are not possible or have not been successful in returning conditions to acceptable levels; the site is to be closed.	Describes an uncorrectable satellite or primitive camp site.

A camp could be closed for environmental reasons: for example, a pack of denning wild dogs near a camp or if the camp was deemed to be too close to the river with no routes for nocturnal toiletry. The accepted norm for auditing was that if a camp needed the same corrective action two years in a row, it should receive a score of five and be closed; in reality, this rarely

happened. The system had no tolerance for any litter in camps: the auditors would score a camp as a four if any litter was found. In reality, there is always some litter at a satellite camp, which would mean that no satellite camp would survive its second audit. To circumvent this impractical outcome, the auditors discounted litter as an issue that could precipitate a score of five.

So, in short, not only was the system highly subjective, dependent on the continuity of auditors, but it was not strictly applied. The audit process was viewed primarily as an annual test that had to be passed; in some instances it was evident that managers had sent staff out to clean up sites prior to the audit.

During the 2008 audit, in an effort to reduce the need for a continuity of auditors, fixed point photography was introduced. The difficulty was that wilderness management principles could not allow for marking the point from where the photograph was taken. This was overcome by taking a second photograph in the reverse direction with a person in it indicating the position and height of the camera (see Figure 14). Whilst this proved effective, the photographs themselves did not, for four reasons:

- It lengthened the auditing process considerably.
- It was difficult to include all the relevant impacts in a single photograph.
- Wilderness guides would change the arrangement of a camp to shift the impact so that success of photographs from the same point would no longer highlight the area of impact.
- Neither management nor trails staff made use of the photographs during the implementation of corrective actions.

What could prove more useful is a photographic account of particular incidents that would require particular attention (See Figure 15).

Wilderness audits have traditionally been carried out in late January/early February when the trail camps have had an opportunity to recover during the rainy season and the rest periods of December and January (when only a few trails would be run). In an attempt to view impact at different times of the year, two other 10-day surveys were conducted, one in August 2007 to



coincide with the end of a busy trail period and the driest time of the year, and the other in April 2008 when the trail season is getting going and the green of summer is fading. Through the close examination of all camping practices, it became possible to start eliminating indicators that did not add value. An account of this is provided in Section 3.8.5.

**Figure 14 – An example of fixed point photography**

**FIXED POINT PHOTOGRAPH    Site: Tortoise Rock (b)**

Type: Primitive Camp                      Location: 28.34133S/31.92567E

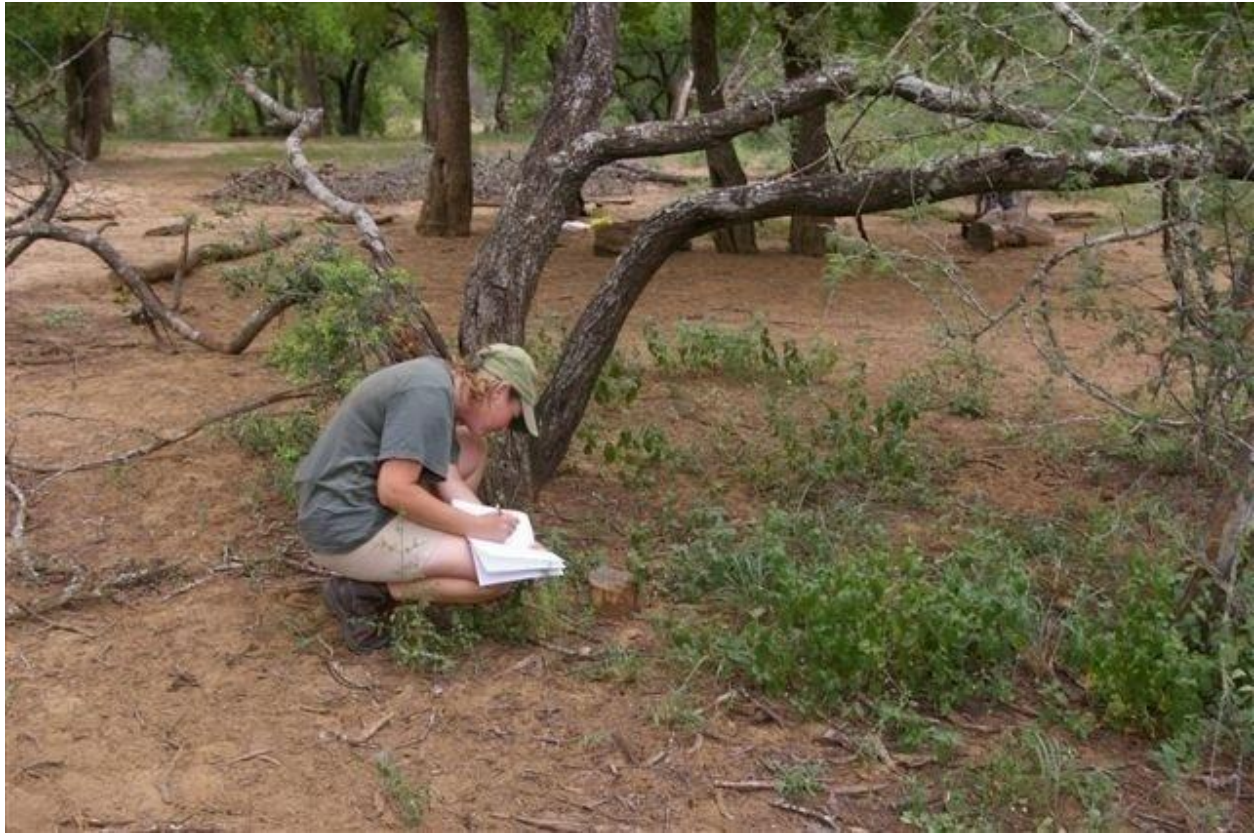
Date: 17/2/08                      Direction from N: 100                      Height: 1m

Focal length: 18                      Configuration: Pentax K100 SLR/6M



Note: this photograph was taken during the 2008 wilderness audit. The A4 paper in the main picture provides an indication of size and contains all the information about the photograph. With a 6M configuration, that information can be retrieved and then is copied under the photograph's title.

**Figure 15 – Photograph of an auditor recording the presence of a cut stump in a satellite camp.** Note: the photograph is taken with a wide angle lens so that the stump's position can be found by the people who would carry out the corrective action and or subsequent audits.



Apart from what was happening at the various areas of usage, it was also important to examine which parts of the wilderness area were being utilized by wilderness trails. All the trails staff from the WLS and Ezemvelo KZN Wildlife recorded their trail routes for the 2007 trail year. It was then possible to determine how often the different WMA were utilized by trails. The results of this exercise are recorded in Table 24 in Section 4.5 and represented topographically in Figure 27.

### **3.7.2 – Game Capture**

The approach to monitoring capture operations involved two actions. The first was to observe what happened on capture operations as closely as possible. This involved accompanying capture teams on both aerial uplifts of black rhino and what is termed “conventional capture” in which motor vehicles are permitted to retrieve rhino, up to a distance of 500 m into the wilderness area. The second course of action was to consult with game capture staff and management staff to get a clearer understanding of, and gain some insight into, the problems capture teams face as a consequence of capturing rhino in the wilderness area. The observations and conversations with members of the game capture team provided insight into the stress that the capture staff are placed under when performing their duties and led me to understand that in spite of pressures to meet targets, the primary concern is the health of the animals.

One of the contentious aspects of capturing animals from the wilderness area revolves around the use of vehicles to remove rhino. The original regulations for the Wilderness area (Natal Parks Game and Fish Preservation Board, 1958) did not prohibit vehicular rhino removal. With the feasibility of aerial uplifts, conventional capture was restricted to what was referred to as the “semi-primitive motorized zone”. Effectively, this consisted of a 500 m band on the inside of the wilderness boundary (which at that time did not extend north of the Black Imfolozi River) (Ezemvelo KZN Wildlife, 1994). By 2000 the wilderness area had been expanded over the Black Imfolozi River but not to the extent of its current description (Ezemvelo KZN Wildlife, 2000).

The semi-primitive motorized zone had been euphemistically re-named “the wilderness support zone” (Ezemvelo KZN Wildlife, 2000, Appendix 1). Its function had not changed, nor had the fact that no one knew where it was when one was in the field. Consequently, it could only be used as a rough guide and in reality activities such as lion call-ups, culling, buffalo capture, animal release sites and, of course, conventional capture, often penetrated more than 500 m into the wilderness area. Examples of this would include the hippopotamus release site Mqizweni Pan (1.3 km into the Wilderness area) and the buffalo TB testing site below the airstrip (1.9 km into the Wilderness area).

In 2008 the boundary of the wilderness area was mapped using the management track in the west, south and east of the wilderness area and the tourist road in the north, thus excluding the complexity of having the fence-line tracks within the wilderness area boundary. A 500 m band on the inside of the track was then mapped to emulate the wilderness support zone of 2000. Where there are exceptional tracks in the wilderness area (going to the Field Ranger camps and the trails base camp Mdindini), the 500 m band was extended down the track, effectively 250 m on either side. Using both *ArcView 9.2* or *Garmin's Map Source* software, these areas can be depicted on Geographical Positioning System (GPS) devices capable of carrying mapping software. It was decided to re-name the wilderness support zone, firstly because it would not be a zone in itself but would fall within the new zonation system, and secondly, because it was primarily an area in which exceptional management activities could take place. Consequently, the term *Peripheral Management Area* (PMA) was coined, which is depicted in Figure 16.

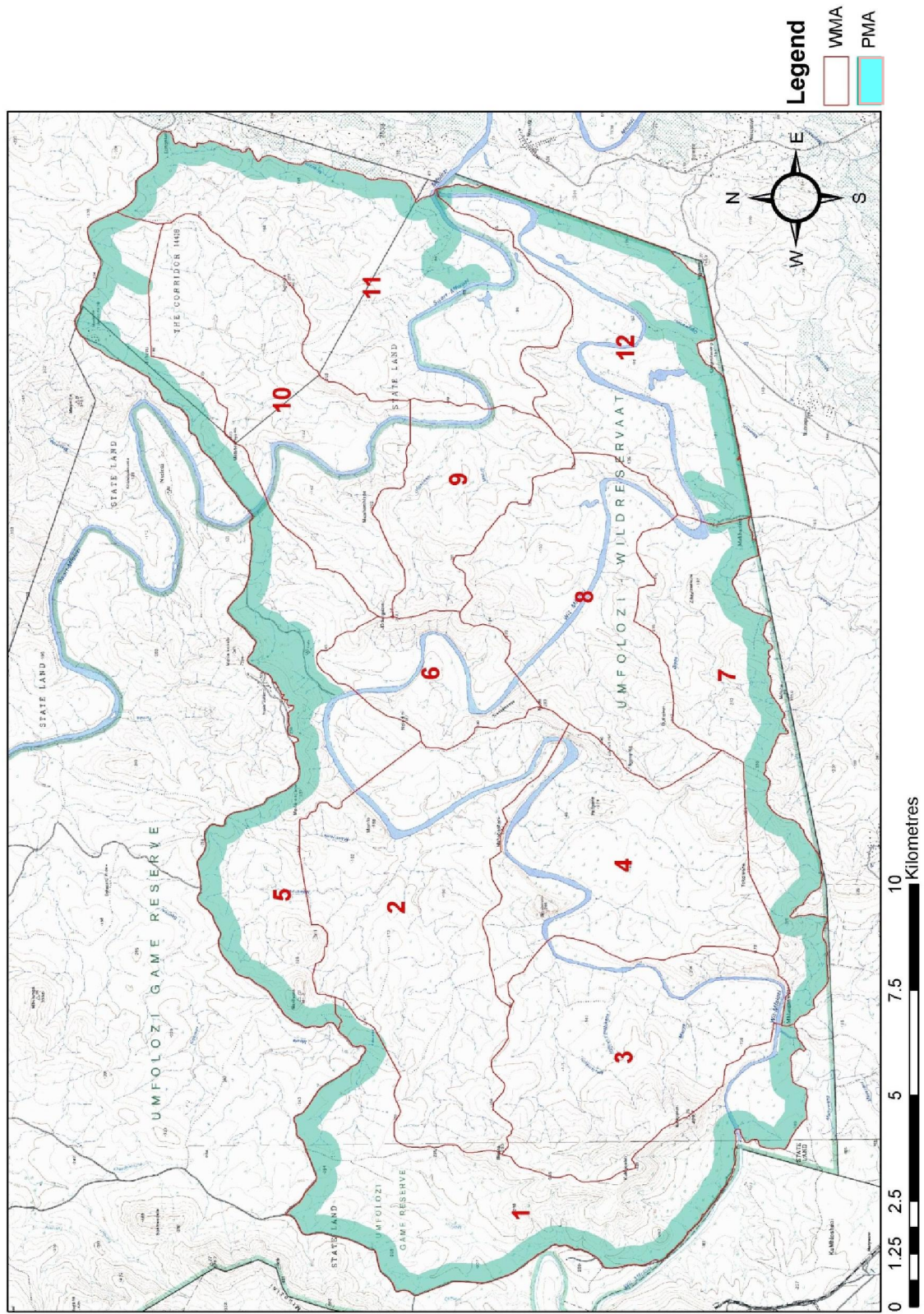
Using a *Garmin e-Trex Legend HCX*-GPS, loaded with topographical maps and overlays of the Wilderness Management Areas and PMA, the second year of monitoring conventional rhino capture was conducted in 2008 with the following findings:

- It is possible to mark the point where a darted rhino goes down and to know immediately which WMA it is in and whether it is within the peripheral management area or not.
- It is possible to record the route of vehicles moving to and from the darted rhino.
- It can be used to mark impacts requiring corrective attention such as cut branches.
- The GPS functions in an airborne helicopter and can record its flight path if necessary.

Now that the inner boundary of the PMA is no longer defined by the calculated guess work of the Capture Officer and Section Ranger, a more formal policy is required to define what happens to darted rhinos that come to rest further into the wilderness area than 500m. The existence of the wilderness area is going to involve the implementation of regulations restricting certain actions. But if a rhino has come to rest 30 or 40 m away from the legitimate pickup point, is it wise to wake it up and release it after having caused considerable stress to the animal and incurred considerable cost (both of which will need to be repeated)?



Figure 16 – The Imfolozi Wilderness Area showing the Peripheral Management Area



It comes down to this: will the regulations for the use of the PMA be cast in stone, or will there be some inbuilt flexibility? The very nature of game capture leads to very unpredictable situations arising, which often require creative, decisive and instantaneous decisions. The opinion of Jeff Cook (2007), the head of game capture for Ezemvelo KZN Wildlife, was that the rigid policy regarding the distances vehicles can penetrate into the wilderness area would result in poor decisions being made, many of which could affect the well-being of the animals. The Conservation Manager, Dave Robertson (2008), agreed with Jeff Cook that exceptional circumstances could necessitate exceptional actions: for example, where waking and releasing an animal could endanger it by virtue of topography (stumbling off a cliff or drowning in a river) or where walking the animal to the crate would put the animal or personnel at significant risk. The policy should make allowance for that flexibility, but the authority and accountability to exercise flexibility must rest with the management team and not Game Capture. This suggests that Section Rangers will always be present to make such decisions. Whilst that is generally the case for black rhino capture, it is seldom the case for white rhino capture. This implies that either the Section Ranger transfers the decision-making process over to Game Capture or the Section Ranger makes the decision without being on site, having had the situation described to him/her. The management team felt that exceptional capture operations exceeding the 500m PMA should be documented. With this in mind, a means of accomplishing that was drafted. An example of monitoring data collected for rhino capture operations extending further than 500 m in the wilderness area is represented in Appendix 1.

It should be noted that discussions with previous park managers (Conway 2007, Wadge, 2009, Hartley 2008, and Reid, 2008) revealed a commonly held opinion that the 500m PMA *was* the compromise and that further flexibility would effectively result in the wilderness regulations not applying to game capture operations. Conway (2007) noted that in situations where a rhino came to rest on an awkward or precarious situation, capture teams have walked half-sedated animals considerable distances to vehicles, and that the same actions must take place with darted animals coming to rest beyond the legitimate reach of vehicles. Reid (2008) pointed out that the current Head of Game Capture (Jeff Cooke) and the current park manager (Dave Robertson) both had led wilderness trails and were therefore sensitized to the values of wilderness; whilst they were accountable, flexibility was acceptable, but without them the rule should be applied rigidly.

Some observations of the monitoring process applied to game capture in the wilderness area were as follows:

- GPS and mapping technology assist greatly in the recording of sites, allowing follow-up investigations.
- The actual indicators of human impact for Game Capture operations will not be significantly different from other wilderness activities, paths/tracks, litter, damage to vegetation, bare ground and needless to say – disturbance to wildlife; the immediate mitigation, to this impact is that its positive ecological outcomes outweigh the negative repercussions. Whilst this is most certainly true, future research into reducing impacts to wildlife and quantifying the benefits versus impacts of management interventions is certainly worthwhile (see Section 5.3 and Table 30 in Section 5.11).
- Whilst the monitoring is quick and simple it requires that someone should do it. If this is not the Section Ranger, then the task must be performed by someone else.
- At this point, exceptional circumstances may warrant deeper penetration into the wilderness than that provided by the PMA, but that reporting mechanism is required.

### **3.7.3 - External Influences**

Alien diseases, alien plants, light and noise pollution were all raised as issues at the Step 2 Workshop. The manner in which they affect the management process is complicated for a number of reasons. By definition, external issues originate from outside the wilderness area and/or park, so corrective action is difficult, because the corrective measures are also outside the sphere of the Ezemvelo KZN Wildlife's authority.

The threat of alien diseases and alien plants to biodiversity is noted in Article 8(h) of the Convention on Biological Diversity (1992). Not only could they threaten the very ecological integrity of the entire park, but the restrictions to human access imposed by the limitations of the wilderness principles may complicate the implementation of corrective actions. Whilst the effects of alien plants and diseases are so serious as to affect the very existence of the wilderness area and the integrity of the park, they are not likely to affect the zonation within the wilderness

area. This is because there will not be varying degrees of tolerance for alien plants and diseases in the different zones. An invasive alien plant in a semi-primitive zone is just as inappropriate as one in a pristine zone. This uncompromising lack of variance makes alien plants an inappropriate LAC indicator. But that is not to say that the users of wilderness areas cannot contribute to the monitoring of these issues, and even contribute to their control. Informal discussions with both the alien plant removal staff and the trails staff of Ezemvelo KZN Wildlife and Wilderness Leadership School revealed an eagerness to co-operate. This kind of relationship should be encouraged and formalized (see Table 30 in Section 5.11).

In 1998/1999 a viewshed analysis of the park was completed to illustrate the visibility of four development nodes from within the wilderness area (see Appendix 2). It may be useful to repeat the exercise looking at the worst-case scenario (see Table 30 in Section 5.11). In other words, how much external land (where a light could hypothetically be placed) is visible from within the wilderness area?

In September 2008 and with the help of the entire management team, as well as the trail staff of both the Ezemvelo KZN Wildlife and the WLS, an exercise was organized aimed at determining which lights at Mpila are visible from within the wilderness area. This involved positioning spotters at various points within or on the edge of the wilderness area. A base team at Mpila Camp then went from building to building, turning individual lights on and off one at a time. By communicating with the spotters on radio, the ground team could determine which lights were visible. The most positive outcome of this exercise was not the data gathered (see Appendix 3), but rather that it precipitated an action plan to eliminate light pollution emanating from the Mpila Camp by the end of 2009 (Ezemvelo KZN Wildlife, 2009b).

With regards to an indicator for both light and noise pollution, it was decided to record whether lights or noise were perceptible from each of the sites that were being audited. As light and noise pollution are considered social indicators (correctly or not), the actual reporting of light and noise would be more relevant than potential impact produced by viewshed analysis or theoretical conjecture.



### **3.7.4 - Management Activities**

Potentially, this was the most contentious aspect of the data gathering because it lies at the heart of the ongoing discussion as to whether or not wilderness areas should be managed and if so, how. This study, however, focuses on the direct impacts of the management practices themselves rather than the repercussions of what those practices do; the ecological effects of removing animals, the fire management policies and other such practices on the relatively small fenced wilderness area is a subject all on its own (see Table 39 in Section 5.11).

The scrutiny of management activities demanded comprehensive co-operation with the Section Rangers, not only to observe management in practice, but also having access to their files and information so that positions of management activities could be mapped and examined. Attention focused on the following:

- **The number of management personnel in the wilderness area at any one time.** This involved analyzing patrol maps. For security reasons, it was decided by the management team that such information should not be recorded in this work. Suffice it to say that the coverage of the wilderness area is comprehensive. At certain times of the year and month, the focus of patrols emphasizes security issues and at other times area coverage is oriented towards biological monitoring. Patrols are done by armed Field Rangers travelling in pairs, and their behaviour is aimed at being inconspicuous to people and undistruptive to wildlife.
- **The buffalo TB project.** This included mapping areas where this work had taken place and monitoring the recovery of the sites after use.
- **Line call-up sites** - where lions are lured to monitoring sites with bait and sound recordings of distressed prey animals. This involved observing the call-up process and monitoring the sites after use. Call-up sites in the wilderness area were mapped.
- **Field Ranger camps.** These exist as islands within the wilderness area, albeit on the periphery. Their positions were mapped. The insides of these camps were considered as temporary homes of the Field Rangers so, to respect their privacy, only the areas outside the fenced camps were subjected to scrutiny and auditing.

- **Overnight camping spots and observation posts.** These are utilized by the Anti-Poaching Unit and Field Rangers. Samples of these were scrutinized and audited. It has long been agreed that these staff should receive training in minimum impact camping. The effects of this policy were evident in the high standard of camping, albeit for clandestine purposes rather than environmental ones. For security purposes, these sites were not marked or mapped.

### **3.7.5 – The Refining of the LAC Indicators**

From the first discussion about indicators in May 2007 (Ezemvelo KZN Wildlife, 2007c), the issues determining the type of indicators to be used were tabled as an interim measure (see Tables 8, 9 and 10 below)

**Table 8 - Resource Indicators**

<b>Impacts (internal)</b>	<b>Indicators</b>
Damage to vegetation	1. Number of cut trees 2. Area of bare ground 3. Number and length of human made paths
Disturbance to wildlife	4. Number of camps/area/unit time 5. Number of management sites/area/unit time 6. Number of human encounters 7. Disturbance index 8. Number of aircraft operations
Human induced erosion	9. Areas of eroded ground
Litter	10. Number of items/unit area
<b>External impacts</b>	
Poaching	11. Requires ongoing monitoring but there will be no differentiation between zones
Alien plants	
Alien diseases	
Water quality	12. Number of items/unit area
Litter	13. Number of items/unit area

**Table 9 - Social Indicators**

<b>Impacts (internal)</b>	<b>Indicators</b>
Over crowding	14. Number of encounters
Damage to vegetation	15. Number of cut branches 16. Areas of bare ground
Litter	17. Number of items/unit area (including coals in camp litter)
<b>External impacts</b>	
Light pollution	18. Number of complaints plus view-shed analysis
Noise pollution	19. Number of complaints

**Table 10 - Additional issues that may not require an indicator but warrant on-going monitoring**

Shots fired? Trails – warning shots, animals killed
Evacuations
Research exceptions, lion call ups, protection of trees with vulture nests
Human induced erosion

As mentioned previously, at the beginning of Section 3.8, indicators for the LAC process need to meet the criteria of being measurable, time effective, cost effective, and practically functional (Stankey *et al*, 1985). Certain indicators had to be dismissed because they did not meet all or some of these requirements.

It has already been mentioned (3.8.3) that the external influences of alien plants and diseases as well as poaching would not be used for indicators. Some issues were combined: for example, human induced erosion (raised at the Step 2 Workshop) was included within the bare ground index, representing an extreme consequence of it. The resource or ecological issue of people disturbing wildlife by virtue of numbers or density could be measured by the social indicator that measures the number of group encounters.

It was agreed that the number of aircraft operations over the wilderness area needed to be monitored and controlled (see Table 11 below) but that at this point, a specific LAC indicator

was not required. If the number were to increase or if there were complaints, then it could be added later.

**Table 11 - Flights over the Imfolozi Wilderness Area**

<b>Purpose</b>	<b>Estimated number of Hours</b>	<b>Requires regular EIA</b>	<b>Requires a renewable EIA</b>	<b>Does not require an EIA</b>
Black rhino notching	Helicopter 5 Fixed wing 6		X	
Conventional rhino capture	Variable		X	
Black rhino airlifts	Variable		X	
TB testing	Variable	X		
White rhino counts	14		X	
Antelope capture	Variable	X		
Vulture survey (nests and chick survival)	5	X		
Elephant survey	Not yet		X	
Evacuations	None			X
Security	None			X

One of the issues that has been highlighted since the first wilderness audit in 1997 has been that of firewood depletion around trails camps. Using firewood depletion as an indicator involved recording the amount of available firewood in plots adjacent to trails camps, and comparing those results with control plots away from trails camps. The difficulty arose when it came to defining what constituted “available firewood”.

The generally accepted practice dictates that only dead wood can be collected. But there is a huge variation in the application of this principle, illustrated below:

- Some staff break dead branches from living trees and some do not.
- Some staff break dead wood off dead trees and others wait for dead branches to fall (with the understanding that upright dead wood is another year's firewood).
- Some staff maintain small fires by not collecting wood thicker than their wrist and others prefer thick logs.
- Some staff ration the amount of wood used on the campfire by explaining the principle to trail participants and limiting the amount of wood collected before dark. Others encourage large fires.
- Some staff will not collect firewood with bark because termites or borers may be utilizing it; such wood also creates more smoke. For others, such issues are not considered.
- Some staff will not burn wood covered with living lichen.

Added to all this, different staff develop favourite types of wood and whilst there is much overlap in these selections (*Sprostachus africana* for night-watch or rainy weather, *Tarchonanthus camphoratus* for cooking, *Acacia nigrescens* or *Combretum apiculatum* for baking or barbeques...) it added two complications to the study: less experienced guides would not know of the relative advantages of these woods nor where to find them. The more experienced staff would know where to find them and often firewood collection would not take place in the vicinity of the camp. In order to include all these factors in comparative surveys between the test sites and control sites (and to end up with anything resembling reliable data), the plot sizes gradually increased in size until it was taking up to forty minutes to make a single comparison. It became apparent that useful information from this indicator would demand a lot of time from people with an intimate knowledge of camping practices. Even then such results could be distorted by the park's fire management policy.

Another indicator that was dismissed was that of ground compaction. Measuring this simply and cheaply involved collecting a core of earth from a piece of piping knocked into the ground. By comparing the mass of earth from the compacted core to that from a control area, a notable difference could be recorded. Problems with this indicator are listed below:

- There are many causes of compaction and it is common practice for wilderness guides to make use of areas that are already impacted rather than impacting another area. Isolating compaction caused by one particular activity would be almost impossible.
- If it had been raining, the less compacted ground of a comparison would absorb more water which would distort the mass measurements unless the samples were dried.
- Gathering the data is time consuming and intricate and requires the sampling core pipes, a hammer, spade and scales.

One of the last indicators to be discarded was one that measured the amount of litter being washed down the rivers. Its purpose was to ascertain at what point management should intervene with corrective action. Such litter originating from land upstream of the wilderness area is seldom distributed evenly along the edge of the river but is deposited in clusters. It is common practice for litter to be removed by trail parties or Field Ranger patrols but occasionally there is too much to collect. An index was developed to record the amount and density of litter so that above a certain level a defensible management action could be applied. In the kindest way (but not without humour), the management team and the trails staff informed the author that this was too complicated and that in reality they would not use it. If there were too much litter in one spot, they would report it and deal with it, without the use of the index. For similar reasons, work was halted on the *wildlife disturbance index* which was based on the ratio of black and white rhino sightings in which the animals had or had not become aware of the human presence; the indicator was deemed to be complicated and impractical.

### **3.7.6 - The Formation of the Imfolozi Wilderness Management Forum**

At the Wilderness area steering committee meeting in September 2008 (Ezemvelo KZN Wildlife, 2008) the following indicators were tabled (see Table 12 below).

**Table 12 - Explanation of Indicators for the LAC Process in Imfolozi**

Indicator	Explanation	Resource	Social	Unit of measurement
Number of human <b>encounters</b>	This indicator measures the number of times trail parties encounter other people or signs of other people (be they other trail parties or Field Rangers or researchers) It is a social indicator because seeing other people alters the perception of wilderness and it is also a resource indicator because high numbers of people would affect wildlife.	X	X	Number of encounters/ WMA/unit time
Number of <b>camps</b>	This indicator refers to the number of base, satellite or primitive* camps occurring in a wilderness management area at any one time. (*A <i>primitive</i> camp is a local Imfolozi term for a backpacking camp)	X	X	Number of camps/ WMA
Number of <b>management sites</b>	Management sites include lion call-up sites, buffalo TB testing facilities, animal release sites, or any temporary site necessary for the execution of a wilderness dependant management activity	X		Number of sites/ WMA
Number of <b>cut trees or branches</b>	These refer to uncorrected saw marks on standing trees (living or dead) as a result of management activities, game capture or historic trail activities (when saws were used for firewood collection). Damage to vegetation is negligible in comparison to vegetation damage from wildlife; consequently it is considered a social indicator		X	Present or absent (The standards make no allowance for uncorrected stumps).
Area of <b>bare ground</b>	This refers to areas stripped of ground cover as a consequence of human activity. The measurement just refers to size of the areas and not severity of impact, assuming that problematic erosion will be reported. The indicator aims to provide information about the unnecessary spreading of camping and management sites	X		m <sup>2</sup>
Number of human made <b>paths</b>	This indicator provides information regarding patterns of access. It does not measure the state of the path, although duplicated paths may indicate erosion	X		Number
Number of <b>litter</b> events/ per activity area	The term “litter event” was coined to record the number of visible litter offences rather than individual pieces of foreign matter; for example, a broken bottle would count as one event and not 237 pieces of broken glass.	X		Number of events
<b>Vestiges</b> of human-induced disturbance	These refer to visible incidents of coal clusters from camp fires, wood chips or the unnatural positioning of rocks, wood or soil.		X	Number of events
<b>External lights</b> visible	These refer to lights from outside the park		X	Visible or not
<b>Internal lights</b> visible	These refer to lights from inside the park		X	Visible or not
<b>Noise</b>	These refer to sounds from outside the wilderness area including vehicle, generators, drums, dogs and livestock.		X	Audible or not

In spite of the number of indicators being whittled down to 10, the monitoring required to utilize those indicators required more time than Section Rangers could realistically allocate. For this reason, an additional non-executive body incorporating all the people that make use of or have an interest in the Imfolozi Wilderness Area, was constituted. It would be a consultative body, sharing information about the goings on in the wilderness area but, additionally, people from this forum could perform monitoring functions as part of their regular work or alternatively be called upon to perform specific monitoring tasks. This would not only increase communication and hence co-operation between wilderness users, but by moulding a combination of self-regulation and external regulation, a new culture could be created where the auditing process would be seen as an open opportunity to scrutinize and diminish human impact on the wilderness area, rather than as an annual test that had to be passed. The steering committee agreed with the concept and set the date for the first meeting of the “*Wilderness Management Forum*” for the 2<sup>nd</sup> of February 2009 (Ezemvelo KZN Wildlife, 2008). That meeting was attended by management staff, trails staff of Ezemvelo KZN Wildlife, trails and management staff of the Wilderness Leadership School, staff from Game Capture, the officer in charge of the Anti Poaching Unit, Research and the wild dog monitoring team. The forum agreed with the concept of ongoing self-regulation and monitoring but Jeff Cooke of Game Capture (Ezemvelo KZN Wildlife, 2009c, Pg 1) cautioned against having the “fox guard the chickens”. The idea of closer co-operation between the various users of the wilderness area, and additionally monitoring each other’s work, was eagerly received; trails staff considered that the opportunity to participate in the monitoring of such activities as rhino capture and lion call-ups would be beneficial to their own work. The manner in which monitoring was to be conducted, (directed by the indicators in Table 12) was discussed and examples of monitoring work were exhibited (see Table 13 below). Remembering that LAC was designed to “balance goals with one topic of concern” (Merigiano *et al*, 1998, Pg 39) it was of some concern that the conflicting goals for the Imfolozi Wilderness crossed a number of topics. The Wilderness Management Forum provided a platform and space for dialogue between a broad range of users with multiple objectives. It soon became apparent the forum could be used as a means of finding common ground between conflicting objectives and it will be interesting to see if it continues to perform this function in subsequent gatherings.



In addition to monitoring being conducted throughout the year, an intensive wilderness monitoring exercise would be carried out each year (similar to previous wilderness audits). Dates for the first intensive wilderness monitoring exercise were set for the 16<sup>th</sup> - 23<sup>rd</sup> of February 2009. That exercise was carried out by 21 different people including the Section Rangers, the wild dog monitor, the Conservation Manager, the Ezemvelo KZN Wildlife trails team, the Wilderness Leadership School and the author.

**Table 13 – An example of how monitoring of the Imfolozi Wilderness Area is accomplished using the LAC indicators**

<b>Site name and purpose</b>	<i>Malindini Base Camp</i>	<i>Dengezi Satellite Camp</i>	<i>Makhamisa Top Primitive Camp</i>	<i>Makabosheni Ledge Primitive Camp</i>	<i>Makhamisa Buffalo TB Testing Site</i>	<i>Airstrip Lion Call-Up</i>
<b>Date</b>	<i>29/08/2008</i>	<i>18/04/2008</i>	<i>27/08/2008</i>	<i>18/04/2008</i>	<i>27/08/2008</i>	<i>28/08/2008</i>
<b>WMA</b>	<i>5</i>	<i>6</i>	<i>8</i>	<i>2</i>	<i>12</i>	<i>5</i>
<b>Grid Reference</b>	<i>28,32531s 31,97514e</i>	<i>28,36116s 31,85903e</i>	<i>28,39920s 31,90214e</i>	<i>28,36116s 31,85903e</i>	<i>28,40958s 31,90567e</i>	<i>28,28678s 31,95783e</i>
<b>Monitors (names)</b>	<i>E. Smidt and P. Cryer</i>	<i>E. Smidt and P. Cryer</i>	<i>P. Cryer</i>	<i>E. Smidt and P. Cryer</i>	<i>P. Cryer</i>	<i>E. Smidt and P. Cryer</i>
<b>1 Number of cut trees or branches (Resource)</b>	<i>59</i>	<i>8 in immediate vicinity. Many - surrounding</i>	<i>0</i>	<i>0</i>	<i>6</i>	<i>6</i>
<b>2. Area of bare Ground (Resource)</b>	<i>Car Park 760m<sup>2</sup></i>	<i>160m<sup>2</sup></i>	<i>12m<sup>2</sup></i>	<i>0</i>	<i>2000m<sup>2</sup></i>	<i>0</i>
<b>3. Number and length of human made paths (Resource)</b>	<i>191m</i>	<i>17m + 5m</i>	<i>0</i>	<i>7+4=11m</i>	<i>200m</i>	<i>220m of vehicle track</i>
<b>4. Number of litter events/ per activity area (Resource)</b>	<i>18 (12 of which were in the car park)</i>	<i>14</i>	<i>0</i>	<i>0</i>	<i>11</i>	<i>0</i>
<b>5. Vestiges of human-induced disturbance (Social)</b>	<i>n</i>	<i>5 (2 coal deposits and 3 ashpits)</i>	<i>2 (wood chips)</i>	<i>1 - Coals (undistributed fire mound)</i>	<i>Brush Picking</i>	<i>Brush Picking</i>
<b>6. External lights visible (Social)</b>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>	<i>No</i>
<b>7. Internal lights visible (Social)</b>	<i>No</i>	<i>No</i>	<i>No</i>	<i>Yes (Impila)</i>	<i>No</i>	<i>No</i>
<b>8. External noise audible (Social)</b>	<i>No</i>	<i>No</i>	<i>Yes (Outpost)</i>	<i>No</i>	<i>Yes (Outpost)</i>	<i>No</i>
<b>Wadge Index*</b>	<i>N/A</i>	<i>2</i>	<i>16</i>	<i>16</i>	<i>N/A</i>	<i>N/A</i>

\*The use of the Wadge Index replaces the Modified Frissel Scale; this is explained in Section 3.8.

It differed from what had taken place previously between 1997 and 2008 (the annual wilderness audits) in three respects:

- The information being collected was quantitative rather than qualitative. Consequently, there were fewer value judgments involved in the auditing process and fewer discrepancies and debates between members of the auditing team.
- Because the administrative aspect of auditing a site involved filling in the column of a table (see table 13 above) rather than completing an entire form, the process was considerably quicker.
- The auditing process was applied to all activities in the wilderness area and not just wilderness trails. So, in 2008 the wilderness audit included eleven sites (three satellite camps and eight primitive sites). In 2009, fifty sites were audited, including trails sites, base camps and management sites. Thirty-three of these were completed during the intensive exercise. In the future, it is envisaged that a greater proportion of sites will be scrutinized during the course of the year as the activities are taking place. This will serve to increase the accuracy and sensitivity of the monitoring results, as well as reducing the amount of work required during the intensive monitoring exercise (which will only be required to account for those activities that were not audited during the year, or those that exceeded standards).

Some sites were audited more than once during the year, especially those where corrective action was required. Once the audit results are recorded in a database (see Section 5.4), it will be possible not only to see the most recent monitoring results across the wilderness area, but also to track the history of a particular activity or site. The results of that monitoring exercise along with the monitoring that had been conducted previously, is recorded in Section 4.4 Tables 20-23. Using *Arcview* 9.2 the information from the tables was represented topographically (see Section 4.4 Figures 19-26).

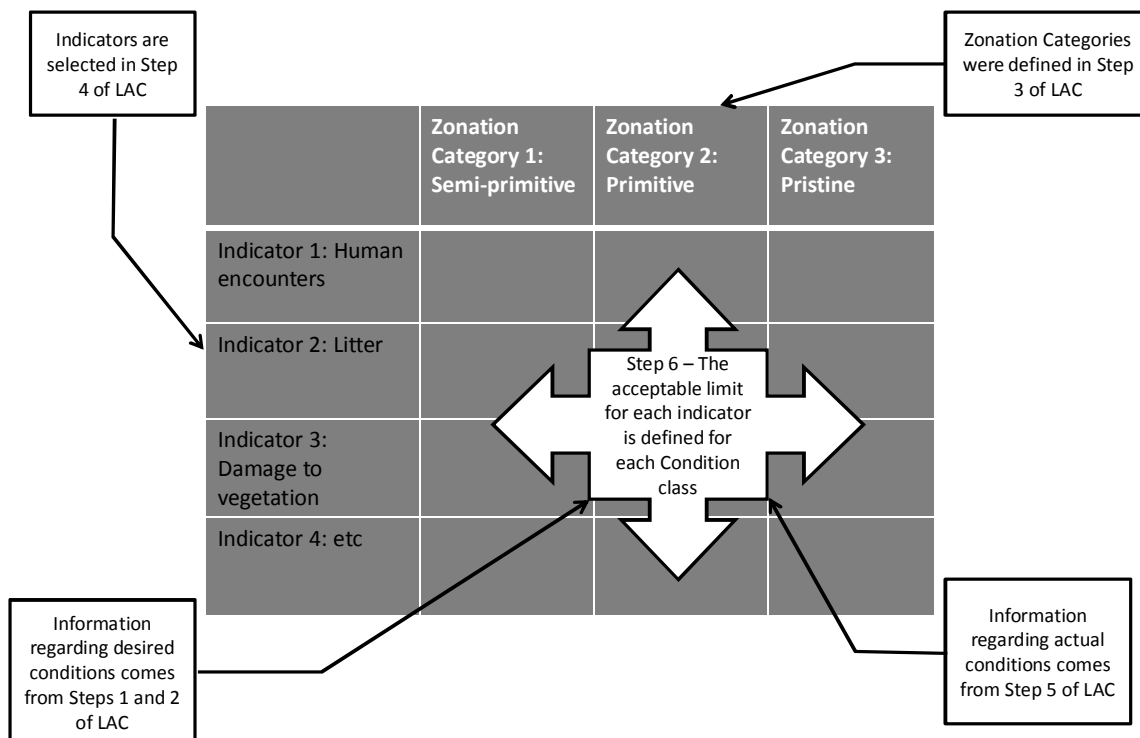
### **3.8 – STEP 6 - SPECIFYING STANDARDS**

The first intensive monitoring exercise that took place in February 2009 was really the trial run of the revised monitoring system. Prior to that, at the Wilderness Area Steering Committee meeting in September 2008, a considerable amount of information regarding human influences

in the Imfolozi Wilderness Area had already been collated. This information was increasingly focused towards the indicators that had been simultaneously refined (see Section 3.7.5) but they also included supplementary notes, photographs and temporal comparisons. Appendix 4 provides an example of a monitoring exercise that was conducted prior to the final selection of indicators.

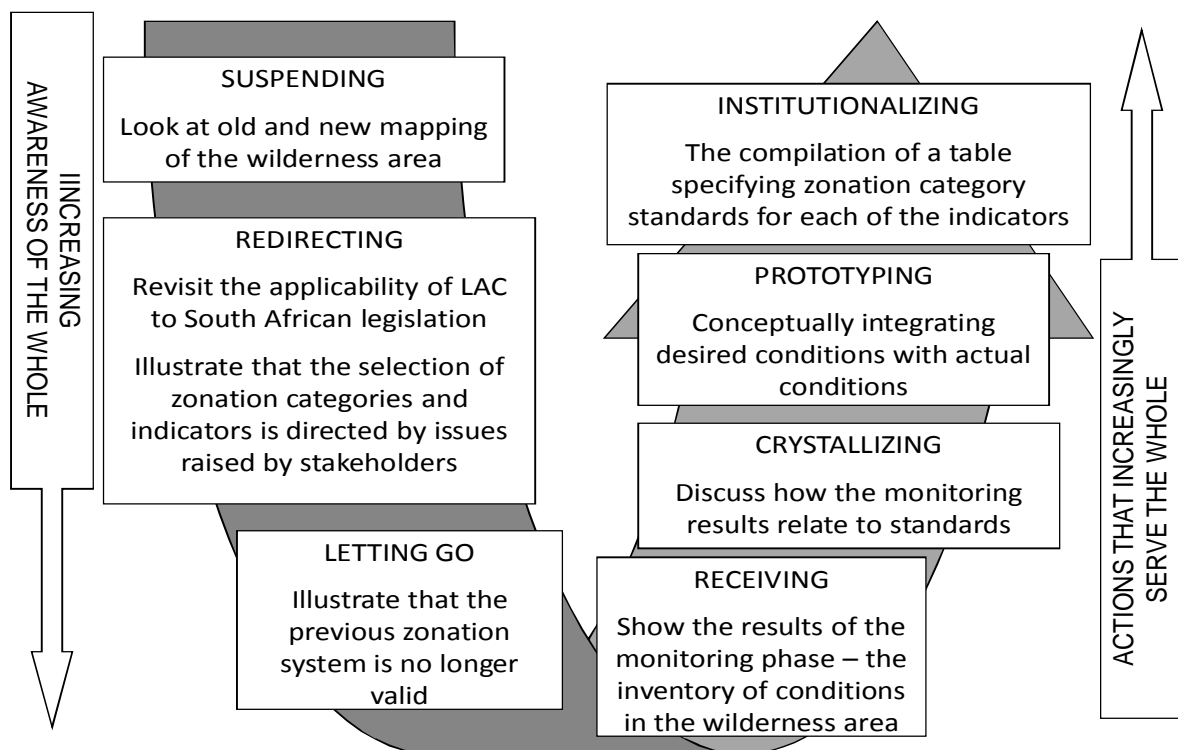
Whilst the project management team had concerns about how ongoing wilderness monitoring was to be conducted and utilized (concerns that were relieved by the formation of the Wilderness Management Forum); sufficient monitoring information (listed below) had been compiled to complete Step 6 of LAC. This step involves looking at the differences between desired conditions and actual monitored conditions and then defining the acceptable standard for pristine, primitive and semi-primitive zonation categories regarding each of the indicators. Essentially this is achieved by the compilation of a table like the one illustrated below in Figure 17.

**Figure 17 – Showing the table that needs to be drawn up to complete Step 6 of LAC and where the information for the table originates**



The thought process to achieve this involves receiving information from a multitude of sources and combining them into a cohesive outcome. More importantly, it was crucial that the establishment of standards was not directed by previous wilderness management strategies employed by the management team. This was especially important because certain LAC terminology had been used in the compilation of the Imfolozi Wilderness Management Plan (Ezemvelo KZN Wildlife, 2000) but the LAC system itself had not been applied. The ability to develop a truly inclusive set of standards was dependent on the management team being able to release their attachment to the preceding system. In this regard, the application of the U-curve (Senge *et al*, 2004) (see Figure 18, below) was helpful in planning the structure of the Step 6 Workshop which took place on the 8<sup>th</sup> of November 2008 and was attended by the project management team.

**Figure 18 – How the U- Curve was Used in Planning the Step 6 LAC Workshop**



There were three parts to the workshop which relate to the three directions of the U-curve. Firstly, the context of Step 6 Workshop was discussed in terms of its place within the LAC

process, reaffirming the necessity for reviewing the management system. The second part of the workshop involved scrutinizing the results of Step 5 – the inventory of existing conditions in the wilderness area. Discussions focused on situations where the existing conditions differed from desired conditions. The following information was made available at the workshop:

- Information collated about the numbers, temporal densities and movements of people in the wilderness. This included: wilderness trails practices; the operations of Field Rangers and the Anti-Poaching Unit; the teams responsible for alien plant removal; and research-based activities including black rhino monitoring, wild dog monitoring and vulture monitoring. It also included information about less regular activities such as rhino capture and notching, vulture marking, legal and illegal harvesting.
- Monitoring results pertaining to vegetation damaged by people in the wilderness. This included: information regarding historic and current wilderness trail practices; the use of chain saws during rhino capture operations; and management practices that impact vegetation (for example, brush packing lion call-up sites to channel the lions into position).
- Information regarding the causes and position of human-induced bare ground within the wilderness area.
- Information regarding the unintentional construction of human-made paths, where and how they form and how they can be differentiated from animal paths.
- Information regarding litter deposited as a consequence of wilderness trails, management activities, Field Ranger camps as well as that brought in by the rivers or wind.
- Information regarding visual indications of human presence that may not be of ecological significance but nevertheless alter people's perception of wilderness.
- Information regarding the use of aircraft over the wilderness area.
- Information regarding light and noise pollution.

This information was used to generate a revised perception of the wilderness to include an understanding of the different human impacts that simultaneously affect it. The third part of the workshop was then to attribute standards to the various indicators that would reflect that revised

perception of the wilderness area and also be in keeping with the park's objectives as described in the IMP.

Standards were written for eight of the ten indicators and these are tabled in Section 4.6, Table 25. The two indicators that did not have standards applied were light and noise pollution. Despite the fact that information is being collected about both these impacts, it was felt that more detailed mapping would be required to generate useful standards (see Table 30 in Section 5.11). At the same time the table of standards was being constructed, the exceptions to those standards were being recorded. These included the existence of base camps and the residual vehicle tracks that served them, the use of the PMA, the use of aircraft, and the conducting of exceptional activities for management, security or research purposes, (see Table 26 in Section 4.6).

It was decided to retain the use of the Modified Frissel Scale but to convert its defining properties to reflect the standards generated in Step 6. Because the rating system has always been significantly different to that developed by Frissel (1978), it was decided that the name should be changed to the *Wadge Index* (Ezemvelo KZN Wildlife, 2009b) after the conservation manager who refined its calibration to measure conditions in Imfolozi. Table 14 describes the new system in terms of the Step 6 Standards.

The value of this system has shifted from being the numerical rating (1996-2008) to providing a summarized overview of acceptability. The appearance of the numbers 2 or 3 in a monitoring results table provides, at a glance, the knowledge that standards have been exceeded (see Tables 20-23 in Section 4.4).

**Table 14 – Indicating the equivalent values of the Modified Frissel Scale and the Wadge Index in terms of the standards generated in Step 6 of LAC**

Properties	Applicability	Modified Frissel Condition Class (1996-2008)	Wadge Index (2009)
No Bare ground or paths, litter <2, debris <2	Acceptable level for an infrequently used primitive camp site	1	1a
2 paths, bare area < 65m <sup>2</sup> , litter <3, debris <3	Acceptable level for a frequently used primitive camp site	2	1b
5 paths, bare area <200m <sup>2</sup> , neat ash pit & shower, litter <5, debris <20	Acceptable level for a frequently used satellite camp site	3	1c
Exceeds limits to the degree that corrective actions could bring condition within the acceptable standard	A site requiring corrective action	4	2
Exceeds limits to the degree that corrective actions could not bring condition within the acceptable standard	Site to be closed	5	3

Note: base camps and management sites at this point are not measured by the system but when monitoring system is tested over time, acceptable levels for base camps and management sites could be represented by the indices *1d* and *1e*

### **3.9 – STEP 7 – IDENTIFYING ALTERNATIVE ZONATION ALLOCATIONS**

Up to this point, the research process has been oriented along three parallel lines:

- Scrutinizing the conditions, types and extent of human impact in the wilderness area.
- Deciding which zonation categories are appropriate to the area and attributing standards to them.
- Deciding how the zonation categories are going to be geographically applied: in other words, how the wilderness area will be divided into different regions to which appropriate zonation categories can be applied.

For the first time within the LAC implementation process, Step 7 starts to allocate zonation categories to the various WMAs but, recognizing the diversity of objectives identified during Step 2 of LAC, it achieves this by asking the stakeholders how they would allocate zonation categories to the various WMAs.

To this end, all the people and groups who had participated in the Step 2 LAC workshop as well as all those who had registered as stakeholders for the Hluhluwe-Imfolozi Park's IMP process were invited to submit zonation allocations. To aid people with their choices, an information package was put together which consisted of the following:

- A flow chart depicting the Limits of Acceptable Change process (the one depicted in Figure 4).
- A list of definitions and policies pertaining to the wilderness area of Imfolozi.
- Lists of objectives, issues and concerns pertaining to the wilderness area of Imfolozi (depicted in Section 4.2, Tables 16, 17 and 18).
- A list and explanation of the indicators that were used to monitor human impact in the wilderness area (depicted in Table 12).
- Maps depicting various aspects of human impact on the wilderness area (depicted in Section 4.4, Figures 19-27).
- The table outlining the standards of acceptable human impact for each of the condition classes (the result of Step 6, depicted in Section 4.6, Tables 25 and 26).

The invitations to participate were sent out on the 27<sup>th</sup> of March 2009 by e-mail and post with six packages being delivered by hand. The covering letter explained that submissions should be returned by the 15<sup>th</sup> of April 2009 but that late submissions would be included in subsequent revisions of the LAC process. A valid criticism of the pack was that the information was complicated. To mitigate this, the covering letter set aside a day in which the LAC implementation process would be explained to those seeking clarity. It also made provision for stakeholders to contact the project management team and to set up a separate meeting. Provision was made to have those meetings or discussions in English or Zulu.



Fourteen submissions were received from individuals, including community members and past staff, NGOs including the Wilderness Foundation, the Wilderness Action Group, the Wilderness Leadership School and the Endangered Wildlife Trust and Departments of Ezemvelo KZN Wildlife, including Game Capture, Research, Imfolozi Wilderness Trails, the Anti-Poaching Unit and, of course, the management team itself. Their zonation allocations are tabled in Section 4.7, Table 27. The original submissions of the management team and researchers are recorded in Table 28.

### **3.10 – STEP 8 – IDENTIFYING MANAGEMENT OBJECTIVES FOR EACH OF THE SUBMITTED ZONATION ALTERNATIVES**

This step was carried out at a day-long workshop held on the 16 April 2009, attended by the project management team as well as the Regional Ecologist, the Imfolozi Trails Manager and the park secretary.

Like the previous workshops, the first hour of it was spent reviewing the process and clarifying the work of Step 8 in the context of the whole project. This involved exhibiting the monitoring data for each of the indicators and comparing the conditions on the ground with the standards we had generated during Step 6. As the title of the Step 8 suggests, its purpose is to review the submissions that were received from stakeholders (in Step 7) and to determine what the management implications would be required for each of those submissions. Management applicability required scrutinizing each zonation allocation (from Step 7) with three questions:

- If the wilderness area were zoned in this way, would it be in keeping with the objectives of the IMP?
- What would be the practical management implications of zoning the wilderness area in this way? (In other words – determine which activities could continue and which activities would have to be altered or stopped.)
- What would be the cost implications of managing the wilderness area with this zonation?

Each of the submissions was approached from the following perspectives:

- How closely does this submission relate to existing conditions in the Imfolozi Wilderness Area or, alternatively, how does it relate to desired conditions?
- What management actions would be required to align existing conditions with the standards of that particular zonation allocation?

Over and above these two questions, which are the essential enquires of Step 8, a third form of probing was investigated:

- What was the intention behind the submitted zonation allocation?

In some cases, this was made easy because the submissions were accompanied by explanatory narratives. In other cases, this had to be gleaned by discussion. It proved a valuable exercise to investigate questions such as, “what was the thinking behind this allocation?” or “what could they have meant by this?” The submissions came from groups or individuals with a wide variety of familiarity with the Imfolozi Wilderness. In some cases, an aspect of an allocation could be seen as impractical but the intention behind the suggestion had validity and could be included by some other means: for example, a submission from the Council of Traditional Healers illustrated a lack of familiarity with the wilderness area and yet the essence of the submission was advocating a protected core with human activities focused on the periphery.

The complexity of comparing each of the submissions with the standards for each zonation category (Semi-primitive, Primitive and Pristine) and the actual conditions on the ground was tackled by having all the information readily available and presented in a visible format. The submissions and monitoring data were presented on maps with the tables that generated those depictions available for more detailed scrutiny if needed. The outcomes of the Step 8 meeting are discussed in Section 4.7.

### **3.11 – STEP 9 – THE EVALUATION AND SELECTION OF A PREFERRED ALTERNATIVE**

The evaluation process began in the last session of the Step 8 Workshop on the 16 April 2009. By viewing the stakeholder input received in Step 7 against the mandate to protect the area as wilderness (summarized in Sections 4.7 and 4.8) a draft zonation was drawn up. The project management team then gave itself two weeks to contemplate the ramifications of the proposed zonation. After that time, there had been no alterations and so on the 1<sup>st</sup> of June 2009 the new zonation was adopted and the Limits of Acceptable Change planning and management system was effectively implemented in the Imfolozi Wilderness Area. The zonation of the Imfolozi Wilderness Area is depicted in Table 29 of the results and depicted topographically in Figure 28 of Section 4.4.

### **3.12 – STEP 10 -THE IMPLEMENTATION OF ACTIONS AND THE MONITORING OF CONDITIONS**

It is now the task of the management team to continue the ongoing monitoring of conditions within the wilderness area. Where current conditions exceed the standard for that area, management interventions are being implemented. These are recorded in Section 4.9.

## **CHAPTER 4 – RESULTS AND DISCUSSION**

This chapter presents the results for each of the LAC steps. The sequence of tables and maps portray a story in themselves, because they follow the sequence of the LAC process. For each set of tables or maps, there is reference as to where those results are mentioned within the methods chapter. In many cases the results are accompanied by comments that: highlight certain aspects of the results, explain the reasoning and context, or provide explanation necessary for the subsequent results.

### **4.1 - RESULTS OF STEP 1– PLANNING GOALS**

(Referred to in Section 3.3)

Table 15 lists the documents that affect and, indeed, define the parameters of the LAC planning process in the Imfolozi. What is conspicuously absent from this list is the co-management agreement between Ezemvelo KZN Wildlife and the successful land claimants (now land owners) of the Corridor Land Claim. The area concerned includes a section of the Imfolozi Wilderness Area. If the protected area management process continues to develop and to encourage increased interaction with surrounding communities, then it is likely that there will be more agreements to add to this list.

**Table 15 – Showing the documents that define and refine the mandate for the wilderness area of Imfolozi**

<b>Law/Document</b>	<b>Significance</b>
National Environmental Management: Protected Areas Act No. 57 of 2003.	<ul style="list-style-type: none"> <li>• Defining Wilderness</li> <li>• management planning</li> <li>• proclamation</li> <li>• public participation</li> </ul>
KwaZulu-Natal Nature Conservation Act No.9 of 1997.	<ul style="list-style-type: none"> <li>• Park proclamation history</li> <li>• Delegation of authority through Ezemvelo KZN Wildlife</li> </ul>
Commission on the Restitution of Land Rights. 2007. Annual Report.	<ul style="list-style-type: none"> <li>• Land claims</li> </ul>
Ezemvelo KZN Wildlife board minutes	<ul style="list-style-type: none"> <li>• Initial delineation of the to Imfolozi Wilderness area,</li> <li>• subsequent enlargements</li> </ul>
Ezemvelo KZN Wildlife. 1999. Management of Wilderness Areas. Policy file No5,	<ul style="list-style-type: none"> <li>• Emphasis on legal proclamation</li> <li>• Emphasis on biodiversity</li> <li>• Emphasis on solitude education and recreation</li> <li>• Wilderness management based on the LAC process</li> </ul>
Ezemvelo-KZN Wildlife. 2008. Integrated Management Plan: Hluhluwe-iMfolozi Park, South Africa.	<ul style="list-style-type: none"> <li>• Public approval for the Wilderness area</li> <li>• Support for the review of the management planning process through the LAC</li> <li>• Support the guiding role of the Wilderness area steering committee</li> </ul>
The Management Plan for the Umfolozi Wilderness. Third Review.	<ul style="list-style-type: none"> <li>• Wilderness management principles</li> <li>• Formation of the Wilderness area steering committee</li> </ul>
Imfolozi Wilderness Area Steering Committee minutes	<ul style="list-style-type: none"> <li>• Recommendation to review the management system for him to Imfolozi Wilderness area</li> </ul>
Agreements with the public	<ul style="list-style-type: none"> <li>• Day walks</li> <li>• Wilderness trails</li> </ul>
Agreements with NGOs	<ul style="list-style-type: none"> <li>• Agreement with the Wilderness Leadership School</li> </ul>
The Constitution	<ul style="list-style-type: none"> <li>• People's right to a healthy environment</li> <li>• The anthropocentric nature of South African law</li> </ul>
National Environmental Management: Biodiversity Act No. 10 of 2004	<ul style="list-style-type: none"> <li>• Conservation of biodiversity is a fundamental motivation for the existence of the wilderness</li> </ul>

## **4.2 – RESULTS OF STEP 2- IDENTIFYING AREA ISSUES AND CONCERNS**

(Referred to in Section 3.6)

The workshop in May 2007 was held to establish and list the diverse objectives, issues and concerns about the Imfolozi Wilderness Area and to confirm the applicability of LAC as the appropriate management tool. Whilst the workshop was successful in highlighting existing issues, the timing of that event preceded the inclusion of some very relevant stakeholders from the IMP public participation processes who could prioritize new issues to be considered within the LAC process. This means that the periodic revision of the LAC process is crucial, starting with the inclusion of new stakeholders and the identification of evolving objectives, issues and concerns. A more encompassing mechanism for identifying stakeholders should be employed, as suggested by Shroyer, Watson and Muir (2003). Constant revision would perhaps paralyze decision making so perhaps the review period could be timed to complement the revisions of the IMP (see Table 30).

**Table 16 - Objectives pertaining to the wilderness area of Imfolozi.**

Note: these were compiled from the various public participation meetings for the Integrated Management Plan or the Limits of Acceptable Change Workshop in May 2007. Contributors ranked their objectives as having high, medium or low priority.

<b>Broad Objective</b>	<b>Specific Objectives</b>
Recognition of the intrinsic value of wilderness	<ol style="list-style-type: none"><li>1. That the natural intrinsic right of the wilderness area to exist is honoured – high</li><li>2. That the sacredness, spirit, life, essence of the wilderness area is our prime value and is served first before instant gratification – high</li><li>3. Ensure the proclamation and integrity of the wilderness area and it's spiritual values - high</li><li>4. Conserve the wildness of the park (sense of place) - high</li></ol>
Prioritize the biodiversity value of the wilderness	<ol style="list-style-type: none"><li>5. Biodiversity aspect of wilderness should be prioritized above the perception of wilderness - high</li><li>6. Ensure that particular conservation attention is given and strategies are implemented to ensure the successful conservation of endangered species and habitats - high</li><li>7. Ensure the control and eradication of alien invasive species - high</li><li>8. Ensure the proclamation of the wilderness area and it's biological values - high</li></ol>

Ensure legal proclamation	<p>9. Ensure the proclamation and integrity of the wilderness area and its related biological and spiritual values - high</p> <p>10. Attain legal protection for wilderness area – high</p> <p>11. Proclamation and Provincial Act and Nationally approved plan – high</p> <p>12. The boundary of the whole wilderness area remains intact with reference to the land claim – high</p> <p>13. Ensure application of Management Plan – high</p> <p>14. Ensure that Institutional Development does not conflict with Management plan – medium</p> <p>15. Accountability by all divisions within the management policy, both to themselves and to the general public – high</p> <p>16. Create an adequate buffer zone, where possible and feasible, in consultation with surrounding communities to reduce conflicts between external and internal management objectives - medium</p>
Engage with all levels of society regarding the management of the wilderness area	<p>17. Make Wilderness relevant to society – medium</p> <p>18. Engage with land claimants to ensure tangible benefits and acceptance of responsibilities and develop strategic partnerships to enable sound management - high</p> <p>19. Ensure continued partnership and effective transparent communication with local traditional councils, communities, government, parastatals, non-governmental organizations and other stakeholders - high</p> <p>20. Create a sense of identity within the neighbouring community (specifically amaZulu) with the cultural and historical importance of the park - high</p>
Apply wilderness management principles	<p>21. Annual monitoring of LAC and adaptive management – high</p> <p>22. Wilderness should be run by non-intrusive efficient management. - medium</p> <p>23. Minimal external interference – high</p> <p>24. Research monitoring - non-destructive sampling – low</p> <p>25. Allow human utilization of wilderness appropriate to zonations – high</p> <p>26. Cost effective/efficient capture of targeted species in wilderness area – high</p> <p>27. Establish appropriate ecological management/research systems - medium</p> <p>28. Limiting vehicle usage in adjacent areas within the park - medium</p> <p>29. Mitigate external development - medium</p> <p>30. Identify, in partnership with adjacent land owners and residents, how to facilitate potential conservation corridors - high</p>
Create opportunities for personal growth and education	<p>31. To provide a setting for trail experiences where participants become aware of humanities interconnectedness with nature through a perception of wildness - high</p> <p>32. There should be the opportunity for solitude - high</p> <p>33. To carry out experiential environmental education in a wild area – high</p> <p>34. Character of wilderness to stay intact in order to create an opportunity of specialized trail groups, focusing on the healing opportunities of the wilderness – high</p> <p>35. Undertake effective interpretive, education and awareness programmes - medium</p>
Create opportunities for recreation	<p>36. Reduce exclusivity - high</p> <p>37. Provide a range of tourism opportunities that caters to a range of income brackets especially for neighbouring communities within the constraints of the approved - medium</p>

Apply limits to development	<p>38. There should be no sign of contemporary human settlement - high</p> <p>39. Conserve the wildness of the park (sense of place), control development - high</p> <p>40. Ensure that any development or activity within the park adheres to best environmental practice and is in line with the CDP - medium</p>
Inform key people about the wilderness and its management	<p>41. Wilderness trail opportunities for Local Board and Corridor of /hope Committee – high</p> <p>42. Ensure that wilderness support services (Mpila camp and Reservations) are adequately trained in the wilderness information going out – medium</p> <p>43. All staff (wilderness users) to do wilderness principles course and minimum impact camping - medium</p> <p>44. Ensure that all management in the wilderness area is done by people with adequate training. – high</p> <p>45. Mandatory for trails guide (both EKZNW and WLS) to do five training trails (with experienced officers) and exam trail – high</p> <p>46. Ensure appropriate awareness programs are implemented locally, regionally and nationally – medium</p> <p>47. Increase institutional backing - high</p>



**Table 17 - Issues pertaining to the wilderness area of Imfolozi.**

Note: these were compiled from the various public participation meetings for the Integrated Management Plan or the Limits of Acceptable Change Workshop in May 2007. Contributors ranked their issues as having high, medium or low priority.

Broad Issue	Specific Issues
Various human activities in the wilderness having potentially conflicting emphasis, eg – park management, game capture, wilderness trails, security, alien plant removal teams or ecotourism.	<ol style="list-style-type: none"> <li>1. Need to make provision for increasing future use – medium</li> <li>2. Stagger rhino removals out of the wilderness area over time, as opposed to imposing ridged quota's on an annual basis – medium</li> <li>3. Land claim and implementation thereof – high</li> <li>4. Game capture : - removal techniques - low; browse harvesting; dumping of waste – medium</li> <li>5. Economic justification for wilderness areas – high</li> <li>6. Presence of teams to remove alien plants – low</li> <li>7. Pressures for sporting events – medium</li> <li>8. Pressures for filming events – medium</li> <li>9. Possible commercial interests negatively effecting wilderness quality – high</li> <li>10. In the event of a crime scene that needed to be protected/preserved it would be necessary at times to leave conspicuous foreign material e.g. danger tape, spoor boxes and cones in the wilderness area for a limited time period – high</li> <li>11. In the event of using tracker dogs, an essentially alien animal would be entering the wilderness area and influence it by way of noise and bodily waste – high</li> </ol>
Training Issues	<ol style="list-style-type: none"> <li>12. Anti-Poaching Unit must have training in minimum impact camping skills. Only those who have had this training can camp in a pristine category area and they must have the ability to deploy there – high</li> <li>13. Preservation of cultural and historical values; knowledge – low</li> </ol>
Limits of use	<ol style="list-style-type: none"> <li>14. No aircraft flying over the wilderness area except in medical casevac and hot pursuit – high</li> <li>15. Air space use - commercial; tourism (all forms of aircraft – medium</li> <li>16. Sporting events/adventure races (potential demand) – low</li> <li>17. Control increased future usage to above the agreed limits, land use changes in future. Starting of other businesses (albeit wilderness friendly) resulting in over usage – high</li> </ol>
Financial issues	<ol style="list-style-type: none"> <li>18. Budgeting process to be reflected in Management plan (acknowledge that activities cost more to undertake i.e. airlift of rhino – high</li> </ol>

Wilderness Management Issues	19. Monitoring programs must use minimum tool –medium (S KRUGER) 20. Guidelines for research and monitoring (minimum tool) – low 21. Manipulative management intervention is still necessary in wilderness eg alien fauna/flora/disease – low 22. Unclear understanding of LAC's – high 23. Size and area design of wilderness area - no adequate buffer - medium
Environmental Issues	24. Global warming – high 25. Benefits of Ecosystem services – high 26. Viewshed worsening - possibility of influencing land use on the southern boundary
Social Issues	27. Crime – medium 28. Poverty – high 29. Relevance to modern SA society – high 30. Impact from surrounding areas – high 31. Lack of conceptualization of wilderness – medium 32. Training of staff and education of wilderness neighbours – high 33. Need to ensure that the benefits of wilderness are adequately promoted – high
Political & legislative Issues	34. If decision making regarding legislation of the wilderness area originated from above the province then provincial support would reduce - medium 35. Lack of awareness and support from political structures, EKZN Wildlife Board and staff, traditional authorities, and the public including people on boundaries - high. 36. Need for development of norms and standards for wilderness management NEM :P A ACT – high 37. Need to ensure that the wilderness area is legally proclaimed and designated in alignment with NEM : PA ACT – high

**Table 18 - Concerns pertaining to the wilderness area of Imfolozi.**

Note: these were compiled from the various public participation meetings for the Integrated Management Plan or the Limits of Acceptable Change Workshop in May 2007. Contributors ranked their concerns as having high, medium or low priority.

<b>Broad Category</b>	<b>Specific Concern</b>
Poor Support for Wilderness	<ol style="list-style-type: none"> <li>1. Lack of institutional support – high</li> <li>2. Lack of political support – high</li> <li>3. Pressure to make wilderness pay combined with budget cuts – high</li> <li>4. How to entrench the wilderness ethic - in EKZNW, public and local communities – high</li> <li>5. Wilderness management capacity at all levels - high</li> <li>6. Values &amp; benefits of wilderness need to be identified and people need to be able to enjoy them meaningfully - medium</li> <li>7. A perception of exclusivity in respect of iMfolozi wilderness area by rural communities on the borders - high</li> <li>8. Outside political pressure on wilderness area namely proclamation delays – high</li> <li>9. Local brown issues taking precedence over national and international green issues - medium</li> </ol>
Concerns Regarding Visitor Use	<ol style="list-style-type: none"> <li>10. Under utilisation of recreational opportunities – low</li> <li>11. Increased contact with other groups – high</li> <li>12. Increasing demands by high volumes of tourists - medium.</li> </ol>
External Threats	<ol style="list-style-type: none"> <li>13. Inappropriate development around wilderness (in and out of the Protected Area) – high</li> <li>14. River systems transporting alien plants, pathogens, rubbish and silt -high</li> <li>15. Noise pollution (external) - vehicles, train etc. – medium</li> <li>16. Light pollution (external) including glow – medium</li> <li>17. Impacts of mining adjacent to the wilderness – high</li> </ol>
Internal Threats	<ol style="list-style-type: none"> <li>18. Physical pollutions : 1) toilet paper (to mark rhino position 2) darts missed or removed - physical pollution and medical concern.</li> <li>19. Litter from within the wilderness area (i.e. trailists, staff, etc – high</li> <li>20. Noise pollution (internal) - vehicles, staff etc – high</li> <li>21. Light pollution (internal) – high</li> </ol>
Lack of Staff Training	<ol style="list-style-type: none"> <li>22. Wilderness Users unable to blend into the environment - high.</li> <li>23. Lack of training and awareness of guides, managers and supervisors – medium</li> <li>24. Education /spiritual aspect being lost through high staff turnover - passion being lost, lack of training – high</li> <li>25. Lack of support for management restrictions at a management level</li> </ol>
Exceptional Circumstance	<ol style="list-style-type: none"> <li>26. Loading rhino, cutting tree's/branches, moving obstructions</li> <li>27. Wilderness principles verses animal welfare. When is it acceptable to forgo principles to save an animal (priority species) – high</li> </ol>

Alien Diseases and Plants	28. Impact that the wilderness area has on disease management i.e. TB control programme – high
Aircraft	29. Air traffic over wilderness – high
Conflicting Land Use	30. Timing of capture in respect of clashing activities 31. Inappropriate high levels of wilderness users per day, affecting biodiversity and sense of place – high 32. Land claim specifically with reference to the zonation of the designated land use – high 33. Poaching and harvesting - legal and illegal – medium 34. Conflicting interests of commercialization and wilderness 35. Security issues - poachers and dogs seen in the wilderness and endangering guests – medium
Restrictive Use	36. Restrictions on capture techniques in primitive zones 37. Research - destructive sampling - low
Geographical Concerns	38. Wilderness area is small and requires higher levels of management intervention 39. iMfolozi wilderness area not able to be the bench-mark site that wilderness areas are generally regarded as such

### **4.3 - RESULTS OF THE STEP 3 - THE SELECTION OF ZONATION CATEGORIES**

(Referred to in Section 3.7)

The information in the table below is copied verbatim from the table in Appendix 2 of the Integrated Management Plan for the Hluhluwe-Imfolozi Park (Ezemvelo KZN Wildlife, 2009a, Pg 50). The information in the right hand column - *Specific Description in the Context of Hluhluwe-iMfolozi Park*, - comes from the Step 3 meeting held on the 31May, 2007.

**Table 19– Description of the Zonation Categories**

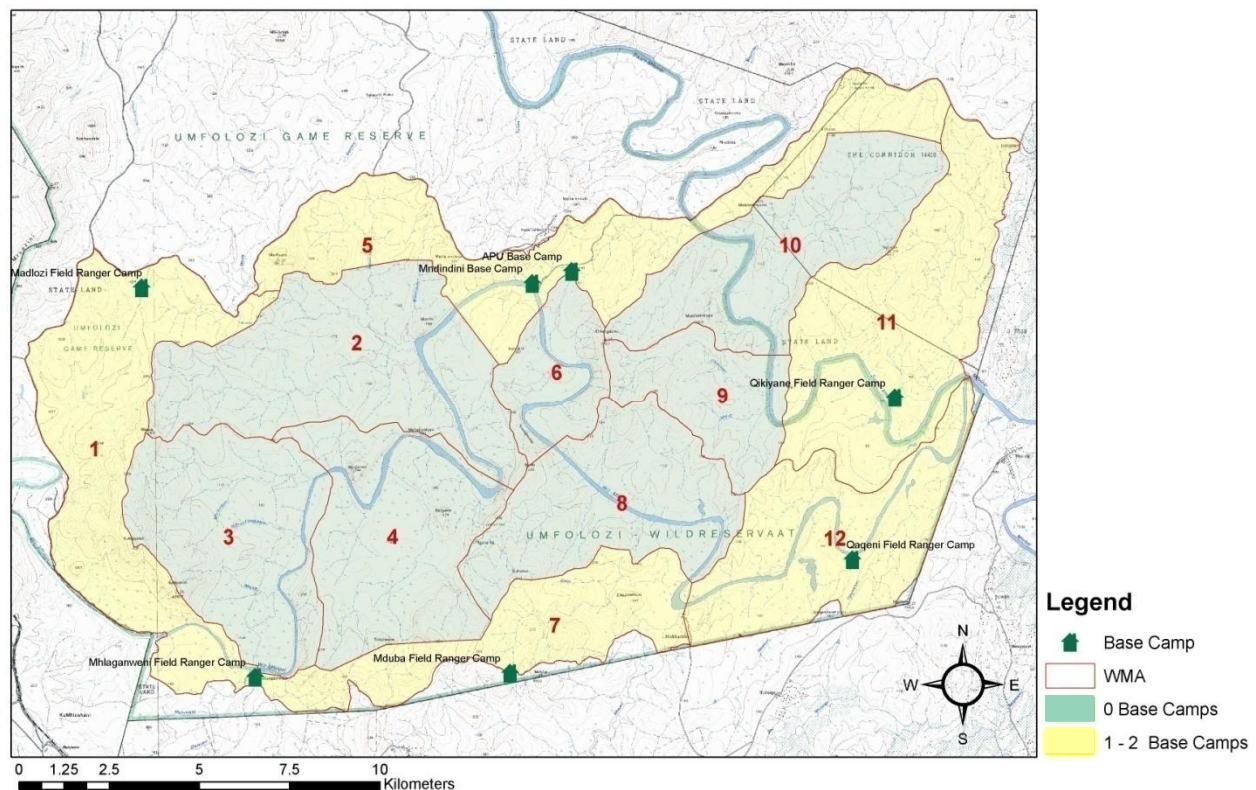
<b>Zonation Category</b>	<b>General Description</b>	<b>Specific Description in the Context of Hluhluwe-iMfolozi Park</b>
Pristine Wilderness	Area is characterized by essentially unmodified natural environment of fairly large size. Interaction between users is very low, and evidence of other users is minimal. The area is managed to be essentially free from evidence of human-induced restrictions and controls. Motorized use not permitted.	An un-modified area in the most remote parts of the wilderness area. No human impacted paths are visible. Camping techniques should be the least invasive to wildlife. Only primitive campsites are present and these should not be immediately visible. Groups are restricted such that encounters would be exceptional. Human habitation within or outside the park is barely, if ever, visible.
Primitive Wilderness	Extremely high probability of experiencing isolation from the sights and sounds of humans, independence, closeness to nature, tranquility and self-reliance through the application of woodsman and outdoor skills in an environment that offers a high degree of challenge and risk.	An un-modified area usually not on the periphery of the wilderness area. Semi-permanent fly-camps may be present. There is no sign of impacted human paths outside the fly-camps. Groups are restricted such that encounters would be exceptional. Human habitation within or outside the park is seldom visible.
Semi-primitive Wilderness	Area is characterized by a predominantly natural or natural appearing environment of moderate to large size, interaction between users is low, but there is often evidence of other users. The area is managed such that minimum on-site controls and restrictions may be present, but are subtle. Motorised use is not permitted.	An un-modified area usually on the periphery of the wilderness area. Impacted human paths are visible and semi-permanent base camps may be present. Although encounters are minimized and group sizes restricted, other people may well be in the area. The area will commonly have views, which would include human habitation outside the wilderness area or park.

#### **4.4 – RESULTS OF STEP 5 - MONITORING RESULTS**

(Referred to in Sections 3.8.6)

These results contain the data that was collected prior to November 2008 (that was used in the establishment of standards in Step 6 of LAC) and is supplemented by the data collected during the intensive monitoring phase in February 2009. In cases where the monitoring of sites was repeated, only the most recent results are depicted. In the tables that follow, cells that are shaded red indicate that conditions exceed the standard; the shading was added after the completion of Step 9. Certain recordings of conditions were more severe than could be practically or accurately measurement; the letter “n” was tabled in these instances.

**Figure 19 –Position of Base Camps**



**Table 20a - Monitoring Results for Base Camps**

<b>Site name and purpose</b>	<b>Mhlaganweni Field Ranger Camp</b>	<b>Mduba Field Ranger Camp</b>	<b>Qaqeni Field Ranger Camp</b>	<b>APU Base</b>
<b>Date</b>	16/02/2009	16/02/2009	16/02/2009	17/02/2009
<b>WMA</b>	7	7	12	5
<b>Grid Reference</b>	28.42303S 31.77736E	28.42270S 31.84947E	28.39518S 31.94661E	28.32240S 31.86794E
<b>Monitors (names)</b>	Munro/Cryer	Munro/Cryer	Munro/Cryer	Gillings/Cryer
<b>Number of cut trees or branches (Resource)</b>	26	3	7	n
<b>Area of bare ground (Resource)</b>	3575m <sup>2</sup>	90m <sup>2</sup>	900m <sup>2</sup>	n
<b>Number of human made paths (Resource)</b>	5	2	2	n
<b>Number of litter events/ per activity area (Resource)</b>	148	21	40	n
<b>Vestiges of human-induced disturbance (Social)</b>	33	18	9	n
<b>External lights visible(Social)</b>	No	Yes, Mlosheni Tower	No	No
<b>Internal lights visible (Social)</b>	No	No	Yes	Yes,Mpila
<b>External noise audible (Social)</b>	Yes, Okhuko Train	No	Yes	Yes, Road Mpila Camp
<b>Wadge Index</b>	N/A	N/A	N/A	N/A

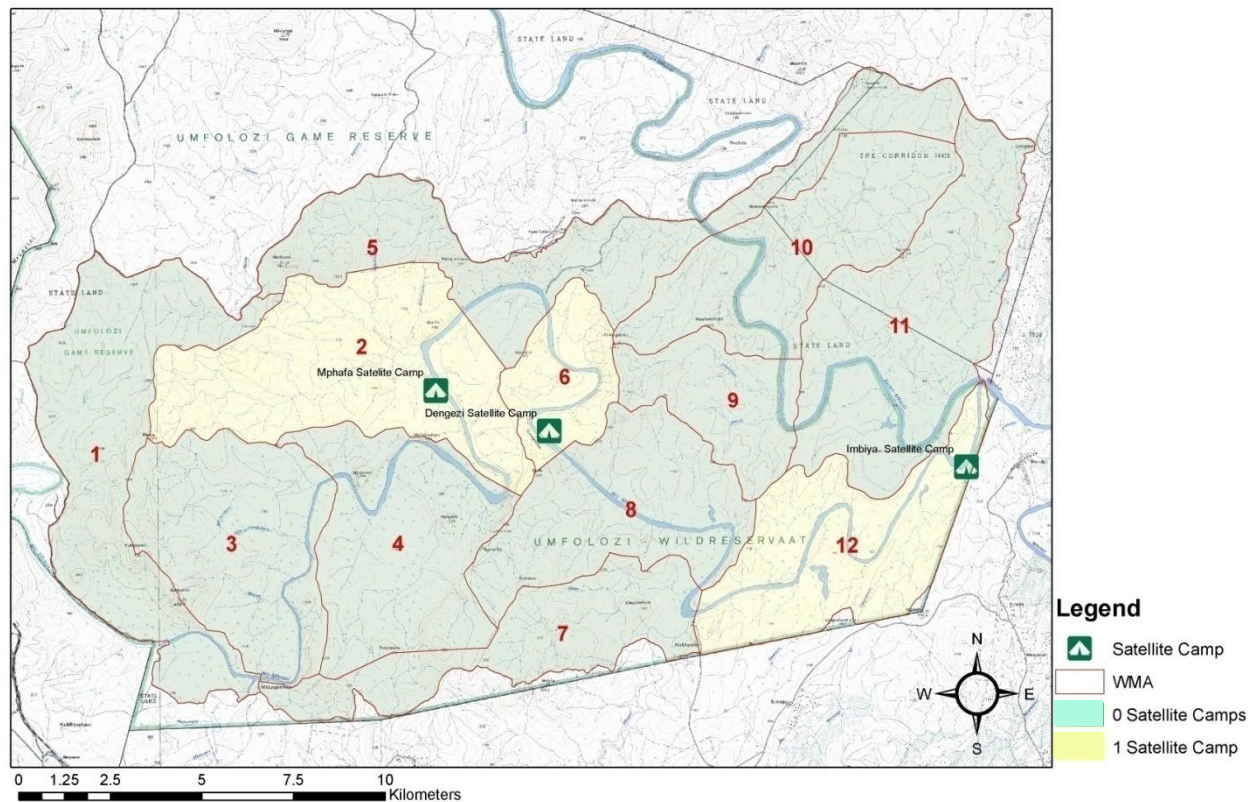
**Table 20b - Monitoring Results for Base Camps**

Site name and purpose	Mdindini Base Camp	Madlozi Field Ranger Camp	Qikiyane Field Ranger Camp
Date	29/08/2008	22/02/2009	18/02/2009
WMA	5	1	11
Grid Reference	28.32531S 31.97514E	28.32539S 31.74639E	28.354.65S 31.95901E
Monitors (names)	Smidt/Cryer	Robertson/Cryer	Ras/Cryer/Graaf
Number of cut trees or branches (Resource)	59	8	4
Area of bare ground (Resource)	Car Park 760m <sup>2</sup>	2000m <sup>2</sup>	600 m <sup>2</sup>
Number of human made paths (Resource)	5	3 plus 1100m vehicle track to camp and pump	2 plus 90m Pump Track
Number of litter events/ per activity area (Resource)	18 (12 of which were in the car park)	87	35
Vestiges of human-induced disturbance (Social)	n	21	17
External lights visible(Social)	No	No	No
Internal lights visible (Social)	No	No	No
External noise audible (Social)	No	No	No
Wadge Index	N/A	N/A	N/A

Cut Branches and litter are problem areas in all the base camps. The APU base is positioned on the old Game Capture Centre; many of the current problems are as a result of historic activities or the perpetuation of inappropriate historic practices.



**Figure 20 –Position of Satellite Camps**

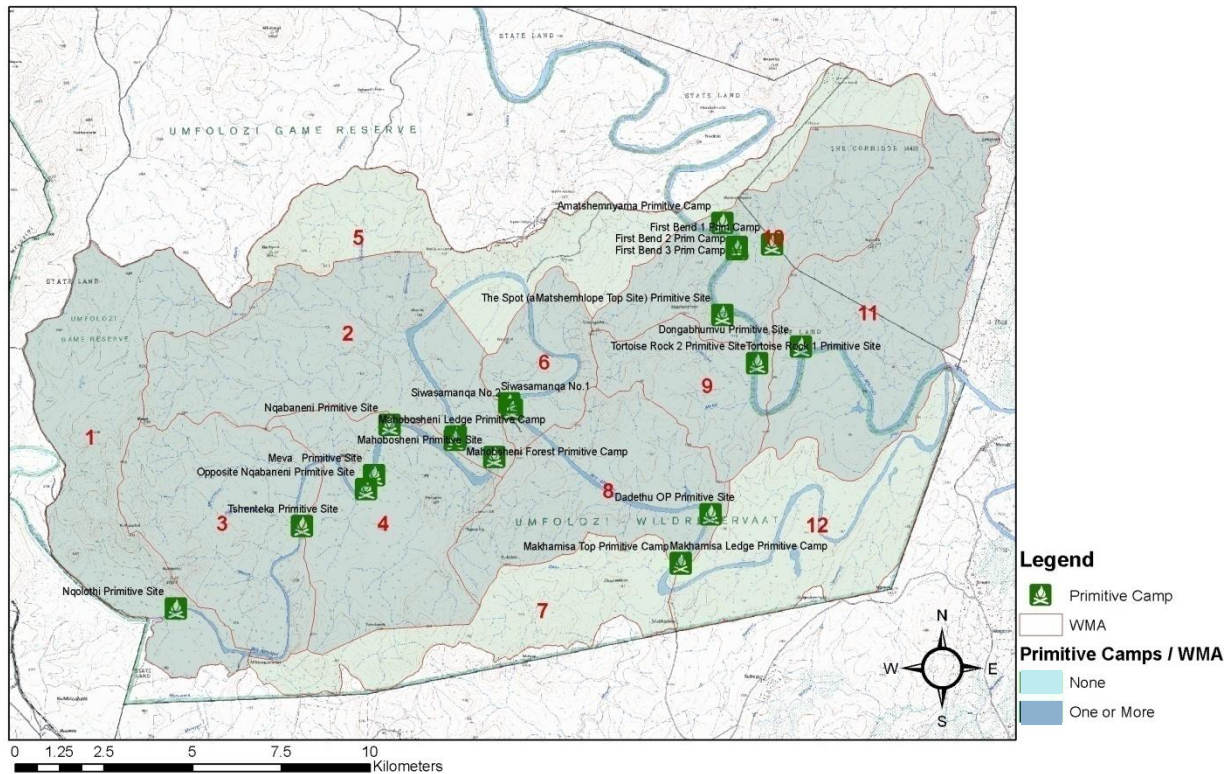


The management intervention to prevent cut branches has been the banning of saws. A time limit is to be set for the removal of existing stumps. It will be interesting to note if the new system of standards has an effect on people's behaviour regarding litter. The *Dengezi Camp* had been rested for a year where as *Mpafa Camp* had been heavily utilized in 2008 (see Table 21). The difference in the amount of bare ground could indicate that areas recover quickly when rested or that the *Mpafa Camp* is more susceptible to the loss of ground cover. The brush packing at the *Mpafa Camp* was carried out as part of the corrective actions of the previous monitoring exercise in 2008; tree roots were becoming exposed as a result increasing bare ground and erosion. This shows that trails staff are responding to problems as they arise and that the amount of bare ground is a responsive indicator. The vehicle track at the Imbiya Satellite Camp was opened by a manager in contravention of regulations. This was addressed in Step 10 (see Section 4.9).

**Table 21 - Monitoring Results for Satellite Camps**

Site name and purpose	Dengezi Satellite Camp	Mpafa Satellite Camp	Imbiya Satellite Camp
Date	21/02/2009	17/02/2009	16/02/2009
WMA	6	2	12
Grid Reference	28.36116S 31.85903E	28.35069S 31.82759E	28.37092S 31.97514E
Monitors (names)	Cryer/Robertson/ Gillings/Munro/Ras	Gillings/Cryer	Munro/Cryer
Number of cut trees or branches (Resource)	n- Historic	1 (behind lounge)	6
Area of bare ground (Resource)	100m <sup>2</sup>	800m <sup>2</sup>	63m <sup>2</sup>
Number of human made paths (Resource)	2	1	4 Vehicle Track Recovering
Number of litter events/ per activity area (Resource)	6	4	9
Vestiges of human-induced disturbance (Social)	1	2 - coal cluster, brush packing	3
External lights visible(Social)	No	No	No
Internal lights visible (Social)	No	No	Yes ( Mpila)
External noise audible (Social)	No	No	Yes (Novunula Village & Somkele Mine)
Wadge Index	2	2	2

**Figure 21 – Position of Monitored Primitive Trail Camp Sites** – Note: a primitive trail is an Ezemvelo KZN Wildlife marketing term to describe hikes that do not make use of fixed camps.



Tables 22a-f show that these backpacking trails are largely operating within the standards of the selected zonation allocation. Of the seventeen sites monitored, five exceeded standards and the causes for those transgressions predate the allocation of the zonation system. The reason for these results may be the long standing application of minimum impact camping mentioned in Section 3.7.1. The photographs in Appendix 4 (Figures A4.5a-c) illustrate the diligence that trails staff apply to minimum impact camping.

**Table 22a - Monitoring Results for Primitive Trail Camps**

<b>Site name and purpose</b>	<b>Siwasamanqa No.1</b>	<b>Siwasamanqa No.2</b>	<b>aMatshemnyama Primitive Camp</b>	<b>First Bend 3 Prim Camp</b>
<b>Date</b>	21/02/2009	21/02/20009	18/02/2009	18/02/2009
<b>WMA</b>	6	6	10	10
<b>Grid Reference</b>	28.35788S 31.85328E	28.35955S 31.85400E	28.31254S 31.91505E	28.31922S 31.91920E
<b>Monitors (names)</b>	Cryer/ Robertson Gillings/Munro/ Ras	Cryer/ Robertson Gillings/Munro/ Ras	Cryer/Saunders/ Zondi	Cryer/Saunders/ Zondi
<b>Number of cut trees or branches (Resource)</b>	0	0	8 (Historic)	0
<b>Area of bare ground (Resource)</b>	0	0	0	0
<b>Number of human made paths (Resource)</b>	0	0	0	2
<b>Number of litter events/ per activity area (Resource)</b>	0	0	1	0
<b>Vestiges of human-induced disturbance (Social)</b>	1 - Stock Piled Fire Wood	Rock Steps 1 (removed immediately)	1 x coal cluster	1 - Rocks for tents
<b>External lights visible(Social)</b>	No	No	No	No
<b>Internal lights visible (Social)</b>	Yes	Yes	No	No
<b>External noise audible (Social)</b>	No	No	Yes, Mpila Rd	Yes, Mpila Hill Rd
<b>Wadge Index</b>	1a	1a	2	1a

**Table 22b - Monitoring Results for Primitive Camps**

<b>Site name and purpose</b>	<b>First Bend 2 Prim Camp</b>	<b>First Bend 1 Prim Camp</b>	<b>Tortoise Rock 1 Primitive Site</b>	<b>Tortoise Rock 2 Primitive Site</b>
<b>Date</b>	18/02/2009	18/02/2009	21/02/2009	21/02/2009
<b>WMA</b>	10	10	9	9
<b>Grid Reference</b>	28.31870S 31.91920E	28.31805S 31.92928E	28.34831S 31.92466E	28.34205S 31.92508E
<b>Monitors (names)</b>	Saunders/Cryer	Saunders/Cryer	Saunders/Zondi	Saunders/Zondi
<b>Number of cut trees or branches (Resource)</b>	0	0	0	0
<b>Area of bare ground (Resource)</b>	0 (recovered in the off season)	7m <sup>2</sup> recovering	0	0 recovered
<b>Number of human made paths (Resource)</b>	2	2	2	2
<b>Number of litter events/ per activity area (Resource)</b>	2	1	3	0
<b>Vestiges of human-induced disturbance (Social)</b>	2 - coals and burnt wood	1 - rocks for tent pegs	0	1 - coal cluster
<b>External lights visible(Social)</b>	No	No	No	No
<b>Internal lights visible (Social)</b>	No	No	No	No
<b>External noise audible (Social)</b>	Yes, Mpila Rd	Yes, Mpila Rd	Yes, Mpila Rd	Yes, Mpila Rd
<b>Wadge Index</b>	1a	1b	1b	1a

**Table 22c - Monitoring Results for Primitive Camps**

Site name and purpose	Dongabhumvu Primitive Site	The Spot Primitive Site	Makhamisa Top Primitive Camp	Makhamisa Ledge Primitive Camp
Date	20/02/2009	20/02/2009	27/08/2008	27/08/2008
WMA	11	10	8	8
Grid Reference	28.34414S 31.93729E	28.33597S 31.91485E	28.39920S 31.90214E	28.39908S 31.90214E
Monitors (names)	Saunders/Zondi	Saunders/Zondi	Cryer	Cryer
Number of cut trees or branches (Resource)	2 (Historic)	2 (Historic)	0	0
Area of bare ground (Resource)	0	0 (recovered)	12m <sup>2</sup>	0
Number of human made paths (Resource)	0	2	0	0
Number of litter events/ per activity area (Resource)	1	1	0	0
Vestiges of human-induced disturbance (Social)	1 - coal cluster	0	2 - wood chips	0
External lights visible(Social)	Yes	No	No	No
Internal lights visible (Social)	No	No	No	No
External noise audible (Social)	Yes - Somkele Mine	Yes, Mpila	Yes ( Outpost)	No
Wadge Index	2	2	2	1a

The stumps at *aMatshemnyama* (Table 22a), *The Spot* and the *Dongabhumvu Site* (Table 22c) are more than ten years old and were not caused by the current trails staff. Nevertheless the process registers them as exceeded standards requiring corrective action. From its age and position on the edge of a cliff, it appears that one of the stumps at *The Spot* may have originated from a rhino capture operation in the early 1990s. An aim of the Wilderness Management Forum

is to have corrective action carried out by those who can most easily apply it. This may not always be the initiators of the impact.

**Table 22d - Monitoring Results for Primitive Camps**

<b>Site name and purpose</b>	<b>Mahobsheni Forest Primitive Camp</b>	<b>Mahobsheni Ledge Primitive Camp</b>	<b>Opposite Nqabaneni Primitive Site</b>	<b>Meva Primitive Site</b>
<b>Date</b>	18/04/2008	18/04/2008	21/02/2008	16/04/2008
<b>WMA</b>	2	2	4	4
<b>Grid Reference</b>	28.36734S 31.83748	28.36116S 31.85903E	28.37955S 31.81176E	28.3161S 31.81405E
<b>Monitors (names)</b>	Smidt/Cryer	Smidt/Cryer	Cryer	Cryer
<b>Number of cut trees or branches (Resource)</b>	0	0	0	0
<b>Area of bare ground (Resource)</b>	0	0	0	0
<b>Number of human made paths (Resource)</b>	0	2	0	0
<b>Number of litter events/ per activity area (Resource)</b>	0	0	0	0
<b>Vestiges of human-induced disturbance (Social)</b>	0	1 - coals (undistributed fire mound)	0	1 wood chips
<b>External lights visible(Social)</b>	No	No	No	No
<b>Internal lights visible (Social)</b>	Yes (Mpila)	Yes (Mpila)	No	No
<b>External noise audible (Social)</b>	No	No	Yes (Train)	Yes (Train)
<b>Wadge Index</b>	1a	1b	1a	1a



The *Mahobosheni Ledge Camp* (Table 22e) is on a slab of rock so there is no bare ground but the two paths push the Wadge Index from 1a to 1b. Whilst the sight of an undistributed fire mound would be a significant social impact for some people, it is a single event so it does not exceed the standard for the *vestiges of human induced disturbance* index

**Table 22e - Monitoring Results for Primitive Camps**

Site name and purpose	Tshentega Primitive Site	Nqolothi Primitive Site	Mahobosheni Primitive Site
Date	14/04/2008	15/04/2008	16/04/2008
WMA	3	4	2
Grid Reference	28.38886S 31.79325E	28.40949S 31.75657E	28.37173S 31.84877E
Monitors (names)	Cryer/Smidt	Cryer/Smidt	Cryer
Number of cut trees or branches (Resource)	0	0	0
Area of bare ground (Resource)	0	0	0
Number of human made paths (Resource)	0	0	0
Number of litter events/ per activity area (Resource)	0	0	0
Vestiges of human-induced disturbance (Social)	0	0	0
External lights visible(Social)	No	No	No
Internal lights visible (Social)	No	Yes (cell tower)	No
External noise audible (Social)	Yes ( Train)	Yes Train	No
Wadge Index	1a	1a	1a



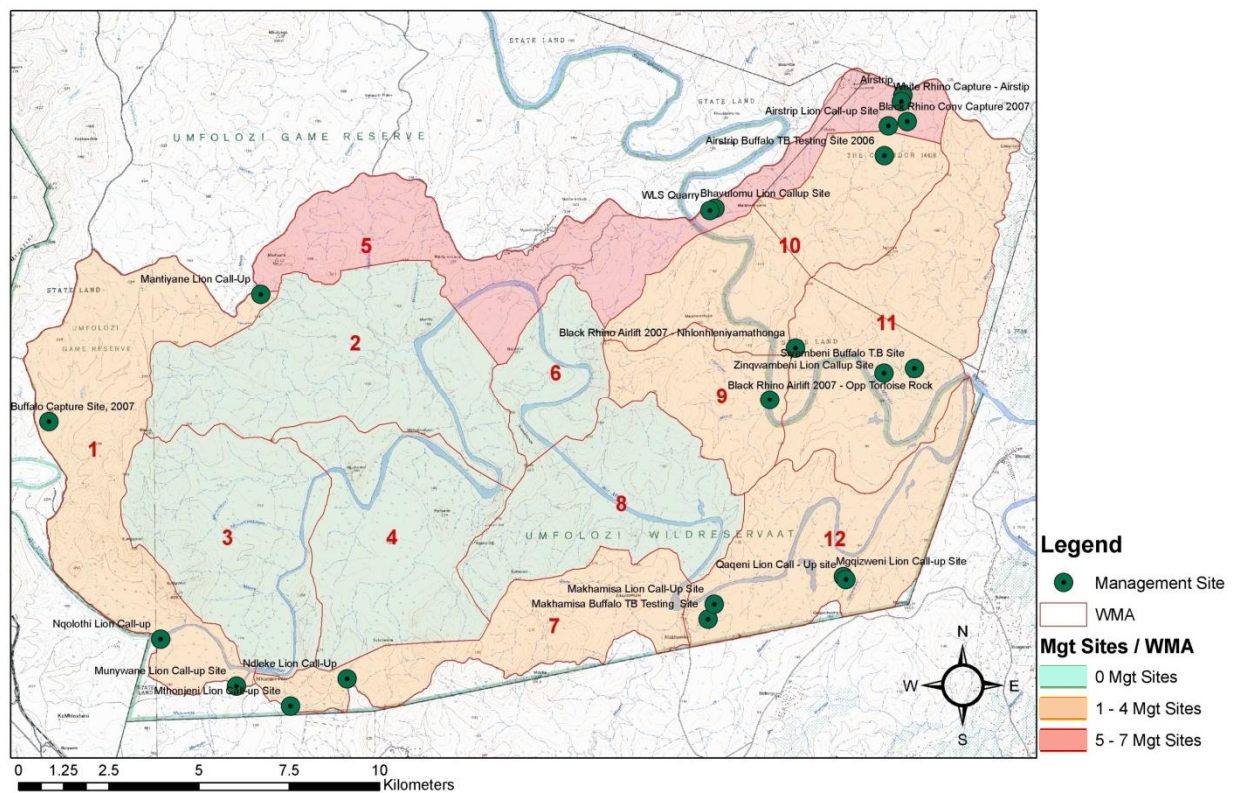
**Table 22f - Monitoring Results for Primitive Camps**

<b>Site name and purpose</b>	<b>Dadethu OP Primitive Site</b>	<b>Nqabaneni Primitive Site</b>
<b>Date</b>	5/8/2008	15/04/2008
<b>WMA</b>	8	4
<b>Grid Reference</b>	28.38688S 31.91095E	28.36336S 31.81868E
<b>Monitors (names)</b>	Cryer	Cryer
<b>Number of cut trees or branches (Resource)</b>	0	0
<b>Area of bare ground (Resource)</b>	7m <sup>2</sup>	0
<b>Number of human made paths (Resource)</b>	0	0
<b>Number of litter events/ per activity area (Resource)</b>	0	0
<b>Vestiges of human-induced disturbance (Social)</b>	1 Wood Chips	0
<b>External lights visible(Social)</b>	Yes - Ntathunga	No
<b>Internal lights visible (Social)</b>	No	No
<b>External noise audible (Social)</b>	Yes (Out Post)	Yes Train
<b>Wadge Index</b>	2	1a

When the *Makhamisa Top Primitive Camp* (Table 22c) and *Dadethu OP Site* (Table 22f) were monitored in August 2008, they were considered to be acceptable in terms of the old audit system. But after the completion of the LAC implementation process, in which WMA 8 was zoned as Pristine, the areas of bare ground meant that the conditions exceeded standards. This

was also reflected in the Wadge Index which shifted from 1b to 2. The corrective action (in other words the application of Step 10 of LAC, see Section 4.9) was to rest the sites.

**Figure 22 –Position of Management Sites**



**Table 23a - Monitoring Results for Management Sites**

<b>Site name and purpose</b>	<b>Buffalo Capture Site, 2007</b>	<b>Bavlomu Lion Callup Site</b>	<b>Zinqwambeni Lion Callup Site</b>	<b>Seyebeni Buffalo T.B Site</b>
<b>Date</b>	22/02/2009	18/02/2009	18/02/2009	18/02/2009
<b>WMA</b>	1	5	11	11
<b>Grid Reference</b>	28.358815S 31.72012E	28.30698 S 31.90873E	28.34847S 31.95600E	28.34734S 31.96459E
<b>Monitors (names)</b>	Robertson/Cryer/ Whittington-ones	Ras/Cryer/Graaf	Ras/Cryer/Graaf	Ras/Cryer/Graaf
<b>Number of cut trees or branches (Resource)</b>	7	4	0	0
<b>Area of bare ground (Resource)</b>	0	0	0	0
<b>Number of human made paths (Resource)</b>	0	1 vehicle track (240m)	1 vehicle track (30m)	1 vehicle track (85m)
<b>Number of litter events/ per activity area (Resource)</b>	0	0	0	8
<b>Vestiges of human-induced disturbance (Social)</b>	0	Brush Packing	0	0
<b>External lights visible(Social)</b>	Yes - cell tower	No	Yes	Yes
<b>Internal lights visible (Social)</b>	Yes -	No	Yes	Yes
<b>External noise audible (Social)</b>	Yes Train	No	Yes	Yes
<b>Wadge Index</b>	N/A	N/A	N/A	N/A

**Table 23b - Monitoring Results for Management Sites**

<b>Site name and purpose</b>	<b>WLS Quarry</b>	<b>Airstrip Lion Call-up Site</b>	<b>Airstrip</b>	<b>Munywana Lion Call-up Site</b>
<b>Date</b>	17/02/2009	20/02/2009	20/02/2009	16/02/2009
<b>WMA</b>	5	5	5	1
<b>Grid Reference</b>	28.30746S 31.90730E	28.8678S 31.95783E	28.27908S 31.96203E	28.42508S 31.77236E
<b>Monitors (names)</b>	Cryer	Cryer	Cryer	Munro/Cryer
<b>Number of cut trees or branches (Resource)</b>	0	0	0	0
<b>Area of bare ground (Resource)</b>	2826m <sup>2</sup>	0	0 (But 40x1000 cleared)	0
<b>Number of human made paths (Resource)</b>	1 vehicle track (80m)	1 vehicle track (1.1km airstrip)	1 vehicle track (1.1km airstrip)	0
<b>Number of litter events/ per activity area (Resource)</b>	0	0	0	0
<b>Vestiges of human-induced disturbance (Social)</b>	Brush Packing	Brush Packing	White stones for helicopter -pad	Brush Packing
<b>External lights visible(Social)</b>	No	Yes (SE)	Yes(SE)	No
<b>Internal lights visible (Social)</b>	Yes	Yes, Mpila Majinda	Yes Mpila & Masinda	No
<b>External noise audible (Social)</b>	Yes, Road	No	Tourist road	Yes-Okhuko Train
<b>Wadge Index</b>	N/A	N/A	N/A	N/A

**Table 23c - Monitoring Results for Management Sites**

Site name and purpose	Nqolothi Lion Call-up	Mthonjeni Lion Call-up Site	Ndleke Lion Call-Up	Mqizweni Lion Call-up Site
Date	16/02/2009	16/02/2009	16/02/2009	16/02/2009
WMA	1	7	7	12
Grid Reference	28.41320S 31.75103E	28.43021S 31.75753E	28.42357S 31.80356E	28.39924S 31.94407E
Monitors (names)	Munro/Cryer	Munro/Cryer	Munro/Cryer	Munro/Cryer
Number of cut trees or branches (Resource)	2	0	1	6
Area of bare ground (Resource)	0	0	0	0
Number of human made paths (Resource)	0	0	0	Old road to hippo release site
Number of litter events/ per activity area (Resource)	0	0	0	0
Vestiges of human-induced disturbance (Social)	Brush Packing	Brush Packing	Brush Packing	Brush Packing
External lights visible(Social)	Yes,Cell Tower Malosheni	Yes-Mhlosheni Tower	Yes - Sangwana Village	Yes, Nduthunga Cell Tower
Internal lights visible (Social)	No	No	Yes, Mpila	Yes,Mpila
External noise audible (Social)	Yes,Okhuko Train	Yes - train and Sangwana	Yes - Road	No
Wadge Index	N/A	N/A	N/A	N/A

With an accurately defined Peripheral Management Area (see Figure 16), the *Mqizweni Lion Call-up Site* (Table 23c) was seen to exceed standards by being situated outside the PMA (see Table 26). It has subsequently been closed.

**Table 23d - Monitoring Results for Management Sites**

Site name and purpose	Qaqeni Lion Call - Up site	Makhamisa Buffalo TB Testing Site	Makhamisa Lion Call-Up Site	Airstrip Lion Call-Up
Date	16/02/2009	27/08/2008	27/08/2008	28/08/2008
WMA	12	12	12	5
Grid Reference	28.40005S 31.94478E	28.40958S 31.90567E	28.40585S 31.90747E	28.28678S 31.95783E
Monitors (names)	Munro/Cryer	Cryer	Cryer	Smidt/Cryer
Number of cut trees or branches (Resource)	3	6	0	6
Area of bare ground (Resource)	0	2000m <sup>2</sup>	63m <sup>2</sup>	0
Number of human made paths (Resource)	0	1 vehicle track 200m	0	1 vehicle track 220m
Number of litter events/ per activity area (Resource)	0	11	1	0
Vestiges of human-induced disturbance (Social)	0	Brush Packing	Brush Packing	Brush Packing
External lights visible(Social)	Yes, Ndthunga	No	No	No
Internal lights visible (Social)	Yes, Mpila	No	No	No
External noise audible (Social)	Yes, Ocilwona Train	Yes ( Outpost)	Yes ( Outpost)	No
Wadge Index	N/A	N/A	N/A	N/A

The buffalo TB testing sites receive intensive impact over a period of four to eight weeks. This is illustrated in the differences between the monitoring results of the *Makhamisa TB Testing Site* and the regularly used *Makhamisa Lion Call-up Site*. These two sites are very close together with similar terrain and vegetation cover.

**Table 23e - Monitoring Results for Management Sites**

<b>Site name and purpose</b>	<b>Mantiyane Lion Call-Up</b>	<b>Airstrip Buffalo TB Testing Site 2006</b>
<b>Date</b>	28/08/2008	20/2/09
<b>WMA</b>	5	10
<b>Grid Reference</b>	28.32734S 31.78028E	28.2942S 31.9566E
<b>Monitors (names)</b>	Cryer	Cryer
<b>Number of cut trees or branches (Resource)</b>	0	0
<b>Area of bare ground (Resource)</b>	0	2800m <sup>2</sup> of pioneers
<b>Number of human made paths (Resource)</b>	0	900m of vehicle track beyond bottom of airstrip
<b>Number of litter events/ per activity area (Resource)</b>	0	0
<b>Vestiges of human-induced disturbance (Social)</b>	Brush Packing	0
<b>External lights visible(Social)</b>	No	No
<b>Internal lights visible (Social)</b>	No	Yes (Masinda)
<b>External noise audible (Social)</b>	No	Yes (Masinda)
<b>Wadge Index</b>	N/A	N/A



The *Airstrip Buffalo TB Testing site* (Table 23e) falls outside the PMA and is now closed (see Section 4.9).

The indicator for human made paths is problematic for a number of reasons. Firstly, differentiating between a human made path and an animal track is not difficult but it does require local knowledge. Secondly, the exceptional circumstances that permit vehicular access (see Tables 23a, b, c and d) necessitate differentiation between vehicle and foot paths. Thirdly, there is no standard for the number of paths permitted at management sites; it may have been presumed that management sites would be regarded as base camps with respect to paths. But this would be an oversight because there is a broad spectrum regarding the severity of impacts associated with management sites, with occasionally used lion call-up sites on the one end and buffalo TB testing sites on the other. It is recommended that the issue of human made paths as an indicator is addressed in the next review (see Table 30).

Figures 23 to 27 provide a geographical depiction of the monitoring data for the various LAC indicators. The information for these maps come from the preceding Tables 20a-b, 21, 22a-f, and 23a-e.

**Figure 23 – Map showing Litter Events**

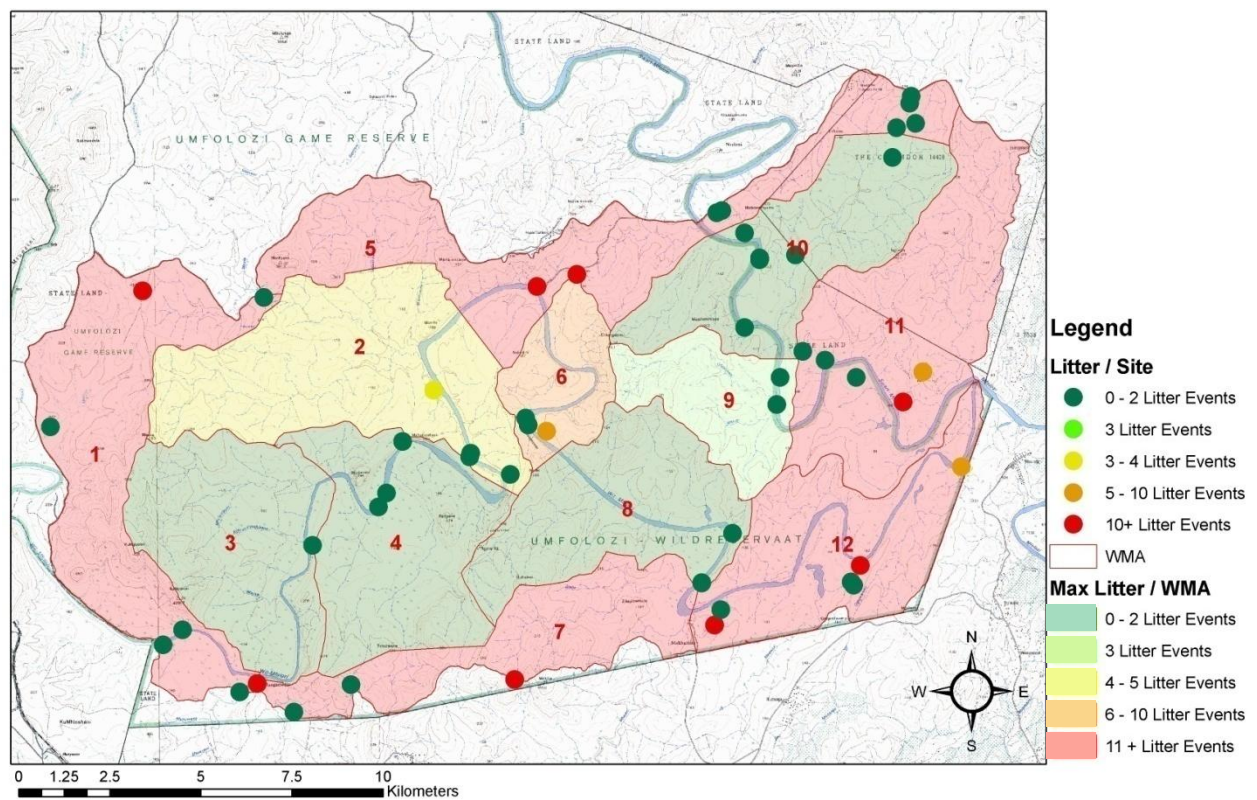
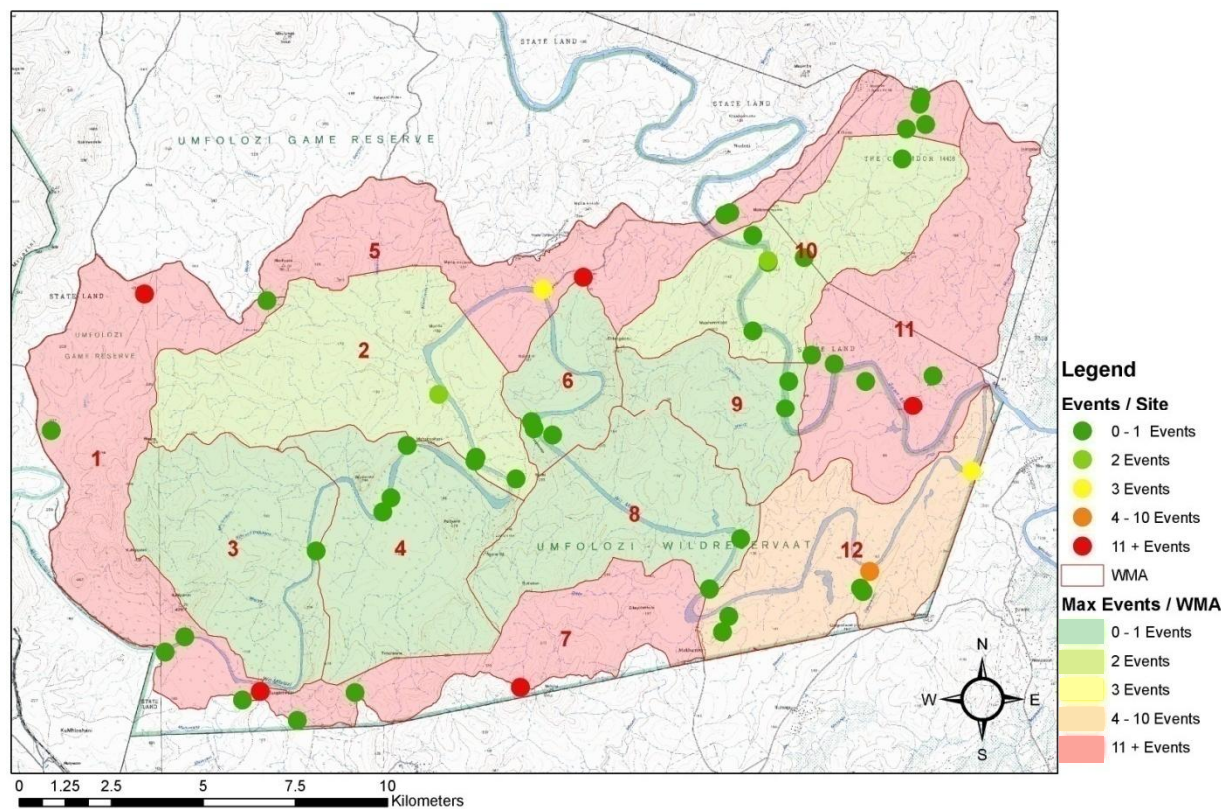
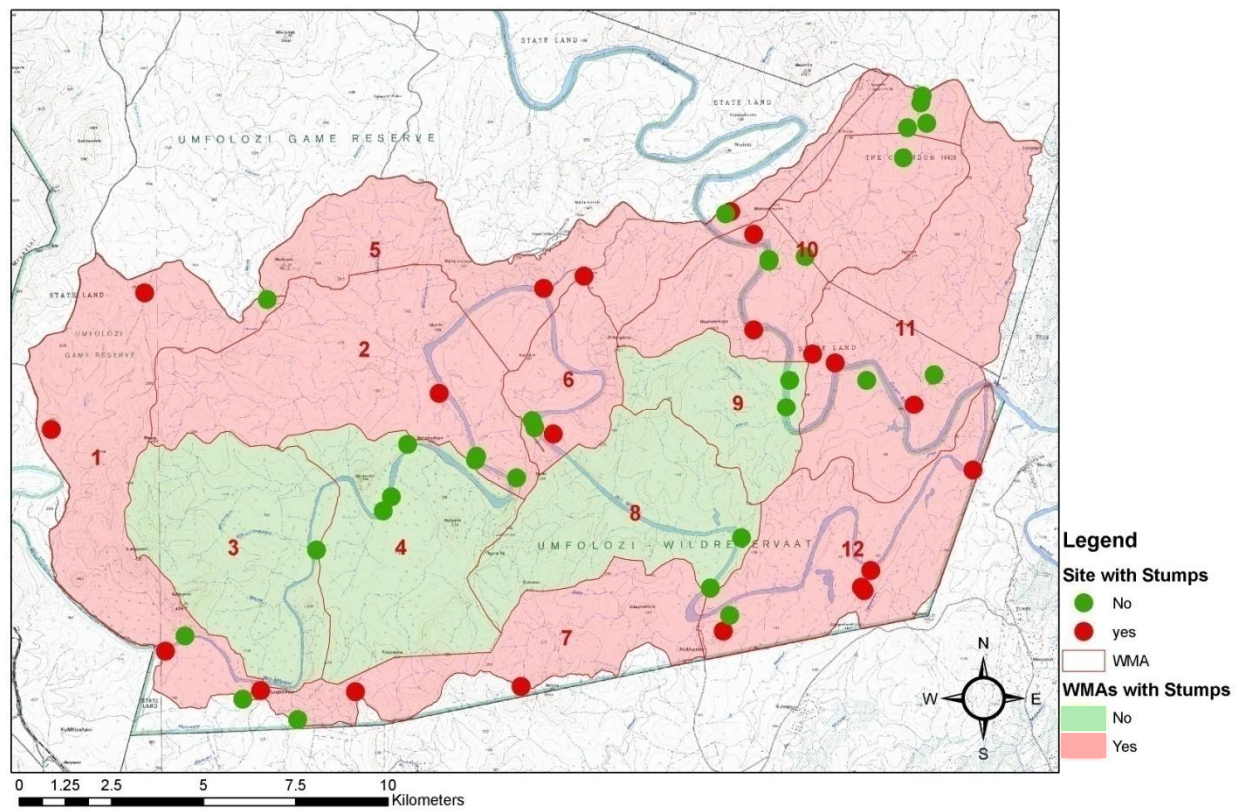


Figure 24 – Map showing Vestiges of Human Disturbance

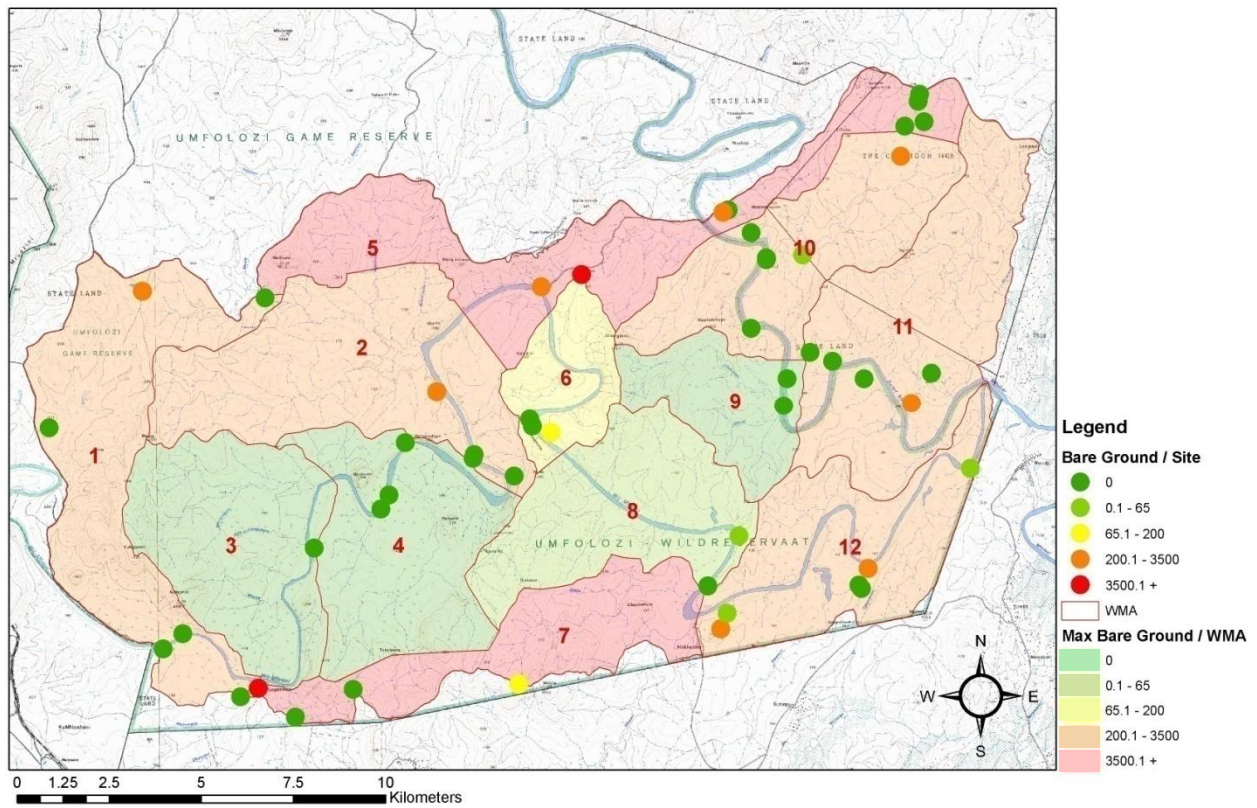




**Figure 25 – Map showing the position of Cut Trees or Branches**

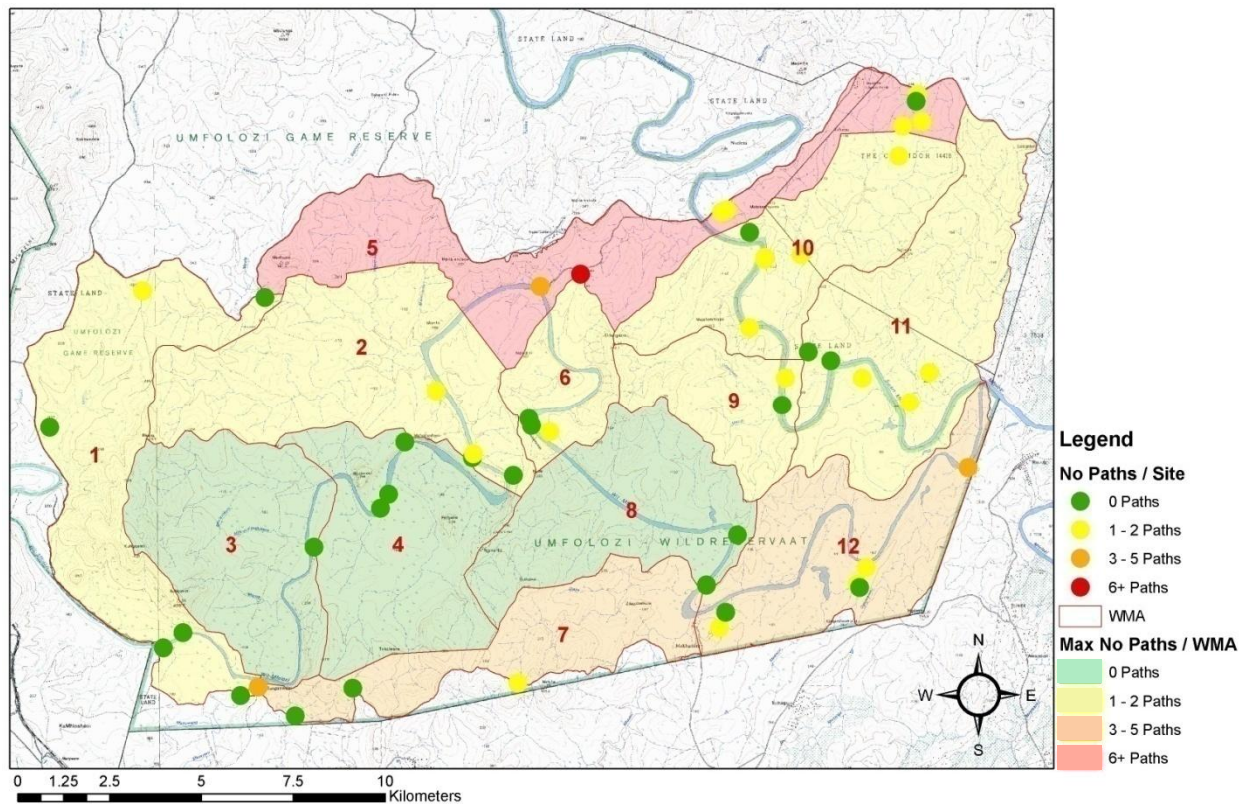


**Figure 26 - Map showing Areas of Bare Ground**





**Figure 27 – Map showing Human-made Paths**



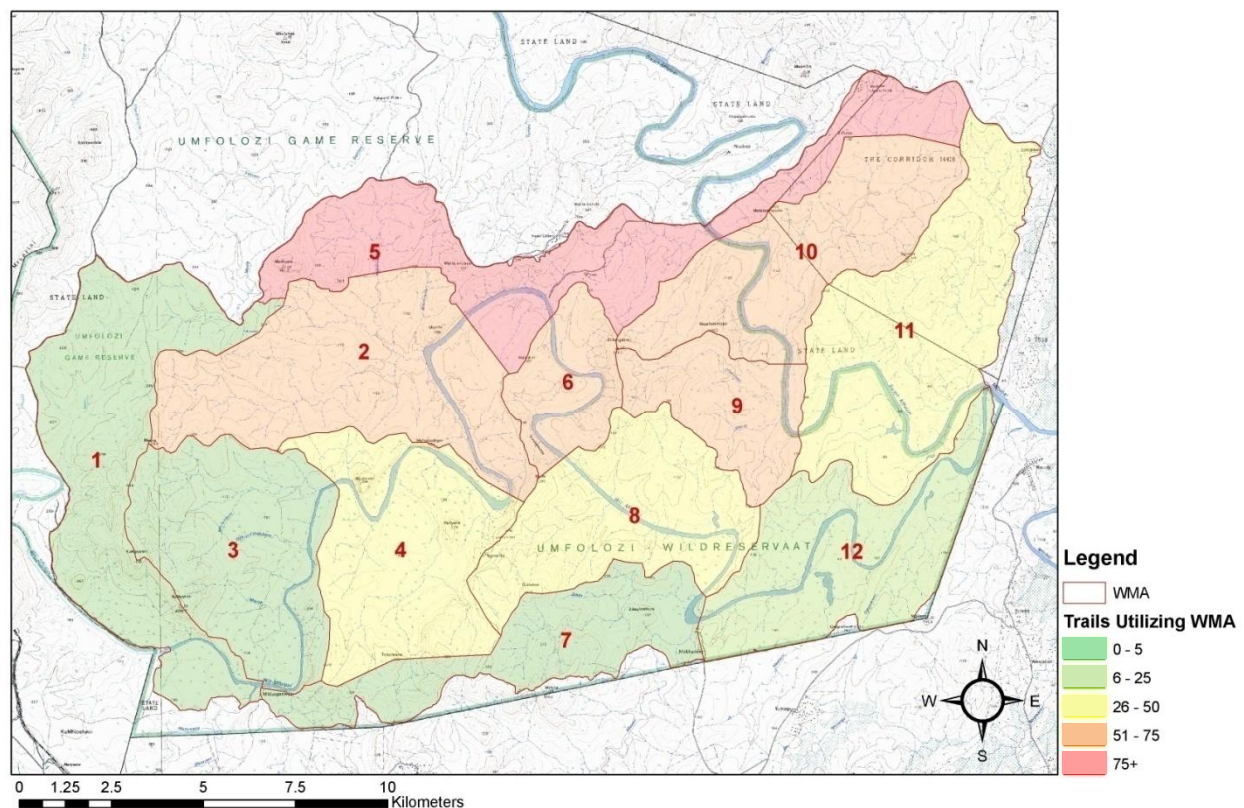
The indicator pertaining to the number of encounters has been stressed as important not only with regards to the Imfolozi Wilderness Area (See Tables 17 and 18 in Section 4.2) but in other applications off LAC as well (Warren, 1997). There has not been any formal mechanism to record or report this type of information but this is currently being addressed by the Wilderness Management Forum (Ezemvelo KZN Wildlife, 2009c). Table 12, in Section 3.8.6, records human encounters as both a social and resource indicator, because not only do encounters diminish people's experience of wilderness but they also reflect something about the number of people in the wilderness. A greater number of people in the wilderness area will have a larger effect on wildlife (Steidl and Powell, 2006). The whole issue of human activities impacting on

wildlife needs further investigation, not only to delineate limits of acceptability but also to measure the advantages of management activities against the effects exacted on the wildlife populations they set out to support (see Table 30). In the absence of data pertaining to the number of human encounters, information was collected that indicated how often trails parties entered the various WMAs.

**Table 24 – Record of the number of times wilderness trails made use of the different WMAs in 2007**

WMA	1	2	3	4	5	6	7	8	9	10	11	12
The number of times a trail entered a WMA	0	61	3	34	122	66	2	35	66	68	31	14

**Figure 28 – Map showing Area Usage by the WLS and Imfolozi Wilderness Trails in 2007**



#### **4.5 - RESULTS OF STEP 6 – SPECIFICATION OF STANDARDS**

(Referred to in Sections 3.9)

In keeping with the sequence of LAC steps, when the standards were drawn up (for Step 6) and when the intensive monitoring exercise was conducted (an expanded repetition of Step 5), the WMAs did not have zonation categories attributed to them (which takes place in Steps 7, 8 and 9 of LAC). By virtue of the order in which the standards were generated, certain assumptions could nevertheless be made before the final zonation was complete. For example, one of the first standards (see Table 25) stipulates that base camps are only allowed in semi-primitive zones; standards written for base camps would then be the minimum acceptable standards for the semi-primitive zonation category.

For certain indicators, the standards mirrored existing conditions; this would mean that those conditions were deemed to be acceptable. These included:

- The number of camps/WMA.
- The number of management sites/WMA.
- Vestiges of human impact.
- Areas of bare ground (with the exception of Mlanganweni Field Ranger Camp).
- The number of human made paths.

There were certain monitored conditions that were not deemed to be acceptable, and standards were accordingly set to represent desired conditions. This applied to the presence of cut branches and litter. The monitoring data shows that current activities around the base camps (Tables 20a and 20b) and historic activities around the trails camps (Tables 21, 22a and 22c) will necessitate corrective interventions



**Table 25 – Standards generated at the Step 6 Workshop.**

Indicator (R= Resource, S= Social)		Semi-primitive Standards	Primitive Standards	Pristine Standards
No. of human Encounters (R&S)	Immediate/ Physical	<3/month	<3/6months	<3,year
	Recent evidence (spoor)	Regular	>1 other group/trail-day	<=1 other group/trail-day
	Entrenched evidence (camp sites)	Base camps, satellite camps and primitive camps present	Satellite camps and primitive camps present	Primitive class 1 camps present
Maximum No. of camps/WMA (R&S)	Base camps/WMA	3	0	0
	Satellite camps/WMA	1	1	0
	Primitive camps/night/WMA	2	2	1 class 1a camp
No. of management sites/WMA (R&S)		4	0	0
Litter events/ site(R)	Base camps and management sites	Margin for error: 0-10	N/A	N/A
	Satellite camps	Margin for error: 0-5	Margin for error: 0-5	N/A
	Primitive camps	Margin for error: 0-3	Margin for error: 0-3	Margin for error: 0-2
	Other (wind and river bourne)	a<=10	a<=10	a<=10
Vestiges of human-induced disturbance (S)	Base camp	Margin for error: 0-49	N/A	N/A
	Satellite camp	Margin for error: 0-19	Margin for error: 0-19	N/A
	Primitive camp	Margin for error: 0-3	Margin for error: 0-3	Margin for error: 0-2
No. of cut trees or branches		For specific management practices (with recordings and rectification). Harvesting of reeds is permissible	0 (with the exception of game capture with recordings and rectification)	0 (with the exception of game capture with recordings and rectification)
Areas of bare ground (R)	Base camps and management sites	3500m <sup>2</sup>	N/A	N/A
	Satellite camps	200m <sup>2</sup>	200m <sup>2</sup>	N/A
	Primitive camps	<=9m Diameter (65m <sup>2</sup> )	<=9m Diameter (65m <sup>2</sup> )	0
Human-made paths (R)	Maximum number	10/Base camp, 5/Satellite camp and 2/ Primitive camp	5/Satellite camp and 2/ Primitive camp	0

**Table 26 – Exceptions to Standards**

Referred to in Section 3.9

<b>Activity/infrastructure</b>	<b>Semi-primitive</b>	<b>Primitive</b>	<b>Pristine</b>
<b>Vehicle intrusions for lion call-up and loading large carcasses after culling</b>	Within 500m of the wilderness boundary	None	None
<b>Vehicle intrusions for conventional rhino capture</b>	Within 500m of the wilderness boundary. The 500m restriction can be exceeded if the animals life would be risked by waking/walking or if the capture operation is targeting a specific animal	None except where an animal's life would be risked by waking/walking	None except where an animal's life would be risked by waking/walking
<b>Buffalo TB testing site</b>	Within 500m of the wilderness boundary.	None	None
<b>Airstrip</b>	Temporary; a management decision has been made to relocate the airstrip away from the wilderness area.	no	no
<b>Flights for rhino capture and monitoring operations including aerial up-lifts.</b>	Yes	Yes	None, unless targeting a specific individual
<b>Helicopter evacuations for life or limb injuries</b>	Yes	Yes	Yes
<b>Flights for reactive and incident specific security issues.</b>	Yes	Yes	Yes
<b>Flights for other wilderness specific monitoring or management activities</b>	Yes (within the terms of the Wilderness Management Plan)	Yes (within the terms of the Wilderness Management Plan)	Yes (within the terms of the Wilderness Management Plan)
<b>Cut branches (to be recorded with GPS and corrected)</b>	For management sites and game capture	game capture and only for guaranteeing the well-being of the animal	game capture and only for guaranteeing the well-being of the animal
<b>Litter</b>	Marking capture sites with toilet roll. Harris fly-traps?	Marking capture sites with toilet roll Harris fly-traps?	Marking capture sites with toilet roll Harris fly-traps?
<b>Outposts (Makhamisa and Masinda)</b>	Managed as islands	none	none
<b>Vehicle tracks to the following base camps: Mlangenweni, Tshokolwane, Mduba, Qaqeni, Qikiyane Mdindini and Madlozi</b>	Yes	no	no

#### **4.6 – RESULTS OF STEP 7– ALTERNATIVE ZONATION ALLOCATIONS**

(Referred to in Section 3.10)

Step 7 of the LAC process involved collating alternative zonation allocations that reflected the various (and often conflicting) management emphases for the wilderness area. The manner in which the project management team chose to accomplish this task had both challenges and rewards. It was realized that input for this step was likely to come from a relatively narrow group of users and, more specifically, those who had a vested interest in the management orientation that would direct the zonation. Nevertheless, it was decided to cast the net wide and to invite input from all the stakeholders that had registered for the IMP process, as well as those organizations and people who had participated in the May 2007, LAC - Step 2 Workshop. To do this, the project management team had to make available all the information that could affect the stakeholders' input. The decision to send out a condensed information package with the invitation in order to access more information on request, had limited success. In spite of the summarized monitoring information being presented on colour coded maps, it was evident from the feedback that the information package was considered, by some, to be confusing and complicated. Consequently some people, who may have wanted to participate, did not. On the other hand, more input was received than if the broad request had not gone out and, furthermore, those additional zonation allocations provided valuable information that was included in the final zonation allocation (see Section 3.11) Of the 148 information packs/invitations that went out (38 by post, 103 by e-mail and 7 delivered by hand), fifteen were returned completed (these did not include the submissions of the project management team). A number of these replies were submitted collectively: for example, the field staff of the Wilderness Leadership School chose to return a combined submission. So, the number of submissions actually exceeded what appears to be a 10% return ratio. It is difficult to measure this ratio against that of other LAC applications because the complexity of the conflicting objectives for the Imfolozi Wilderness Area is unique, as were the methods of including interest groups.

**Table 27 – Results of Step 7– Alternative Zonation Allocations**

Submission	Zonation Category for WMA 1	Zonation Category for WMA 2	Zonation Category for WMA 3	Zonation Category for WMA 4	Zonation Category for WMA 5	Zonation Category for WMA 6	Zonation Category for WMA 7	Zonation Category for WMA 8	Zonation Category for WMA 9	Zonation Category for WMA 10	Zonation Category for WMA 11	Zonation Category for WMA 12
Anti-Poaching Unit	Semi-primitive	Primitive	Primitive	Primitive	Semi-primitive	Primitive	Semi-primitive	Primitive	Primitive	Primitive	Semi-primitive	Semi-primitive
B. Dell (ex-wilderness guide)	Semi-primitive	Pristine	Primitive	Primitive	Semi-primitive	Pristine	Semi-primitive	Pristine	Pristine	Primitive	Semi-primitive	Semi-primitive
EWT -Wild Dog Program	Semi-primitive	Primitive	Pristine	Pristine	Semi-primitive	Primitive	Semi-primitive	Primitive	Primitive	Primitive	Semi-primitive	Semi-primitive
J. Feely (ex-manager and ex-wilderness guide)	Primitive	Pristine	Pristine	Pristine	Primitive	Pristine	Primitive	Pristine	Pristine	Pristine	Primitive	Primitive
J. Forest (ex-manager)	Semi-primitive	Primitive	Pristine	Pristine	Semi-primitive	Primitive	Semi-primitive	Pristine	Primitive	Primitive	Primitive	Semi-primitive
Game Capture	Semi-primitive	Pristine	Primitive	Primitive	Semi-primitive	Pristine	Semi-primitive	Primitive	Primitive	Semi-primitive	Semi-primitive	Semi-primitive
Imfolozi Wilderness Trails	Primitive	Primitive	Pristine	Pristine	Semi-primitive	Primitive	Primitive	Primitive	Primitive	Primitive	Primitive	Semi-primitive
K. Ngubane (Council of Traditional Healers)	Primitive	Primitive	Semi-primitive	Primitive	Pristine	Pristine	Semi-primitive	Primitive	Primitive	Primitive	Semi-primitive	Semi-primitive
I. Read (wilderness guide)	Semi-primitive	Primitive	Pristine	Pristine	Semi-primitive	Primitive	Semi-primitive	Pristine	Primitive	Primitive	Semi-primitive	Semi-primitive
C. Reid (ex-manager and ex-wilderness guide)	Semi-primitive	Pristine	Pristine	Pristine	Semi-primitive	Pristine	Semi-primitive	Pristine	Pristine	Pristine	Primitive	Semi-primitive
M. Weerts (wilderness guide)	Semi-primitive	Primitive	Primitive	Primitive	Semi-primitive	Primitive	Semi-primitive	Primitive	Primitive	Semi-primitive	Semi-primitive	Semi-primitive
D. Densham (Wilderness Action Group)	Semi-primitive	Primitive	Pristine	Pristine	Semi-primitive	Primitive	Semi-primitive	Primitive	Primitive	Semi-primitive	Semi-primitive	Semi-primitive
Wilderness Foundation	Semi-primitive	Primitive	Pristine	Pristine	Semi-primitive	Primitive	Semi-primitive	Pristine	Primitive	Primitive	Semi-primitive	Semi-primitive
Wilderness Leadership School	Semi-primitive	Primitive	Pristine	Pristine	Semi-primitive	Primitive	Semi-primitive	Pristine	Primitive	Primitive	Semi-primitive	Semi-primitive

Scrutiny of the submitted zonation allocations made it is possible to pick up trends of thought that were affecting the allocation of categories to the various WMAs. These are listed below:

- All of the submissions bar one advocated the use of the pristine category somewhere in the allocation and even the one that omitted that category lamented its absence and suggested improving conditions so that it could be included.
- It was clear that biodiversity issues as well as people's perception of wilderness were considered when allocating the zonation categories to the WMAs.
- There was an emphasis on focusing human impact away from the core of the wilderness area.
- Most of the submissions recognized the necessity of Field Ranger camps on the periphery and this precluded the use of pristine or primitive categories for any WMA on the edge of the wilderness area. Management activities such as lion call-up sites similarly precluded the pristine or primitive categorization of peripheral WMAs.
- Submissions which did zone peripheral WMAs as either primitive or pristine were advocating the management of the surrounding land so that it supported a more stringent wilderness zonation.
- From people with an historic connection with the wilderness area there was an emphasis on attaining the highest degree of protection and entrenching a culture of non-degradation.
- Those working in the wilderness (for example Game Capture, the Anti-Poaching Unit and wilderness guides) were motivating towards freedom to operate. Each of those users could explain the importance of their various functions to mitigate their impact and thereby explain a zonation plan which allowed such activities to continue.

The failing of the inclusive approach was that for many stakeholders the information package was their first knowledge of the wilderness area and its management. If public participation in protected areas continues to gain momentum and community conservation efforts are stepped up, as planned, then it is likely that the stakeholders of the Hluhluwe-Imfolozi Park will be better informed and therefore more eager and empowered to contribute in a meaningful way. The project management team's enactment of an inclusive Step 7 proved to be a clumsy first attempt

but it does lay the ground work for the future and illustrates the intention of Ezemvelo KZN Wildlife to engage in a more co-operative form of wilderness management.

**Table 28 – The original submissions of the management team and researchers**

Submission	Zonation Category for WMA 1	Zonation Category for WMA 2	Zonation Category for WMA 3	Zonation Category for WMA 4	Zonation Category for WMA 5	Zonation Category for WMA 6	Zonation Category for WMA 7	Zonation Category for WMA 8	Zonation Category for WMA 9	Zonation Category for WMA 10	Zonation Category for WMA 11	Zonation Category for WMA 12
Imfolozi Management (D. Robertson)	Semi-primitive	Primitive	Pristine	Pristine	Semi-primitive	Primitive	Semi-primitive	Pristine	Pristine	Primitive	Semi-primitive	Semi-primitive
Ezemvelo KZN Wildlife Research (D. Druce)	Semi-primitive	Primitive	Primitive	Pristine	Semi-primitive	Semi-primitive	Semi-primitive	Primitive	Primitive	Semi-primitive	Semi-primitive	Semi-primitive
Wilderness Research Project (P. Cryer)	Semi-primitive	Primitive	Pristine	Pristine	Semi-primitive	Primitive	Semi-primitive	Primitive	Primitive	Primitive	Semi-primitive	Semi-primitive

#### **4.7 - RESULTS OF STEP 8 – IDENTIFYING MANAGEMENT OBJECTIVES FOR EACH THE ZONATION ALTERNATIVES**

The Step 8 Workshop in April 2009 was attended by the project management team and was complemented by the Regional Ecologist, the Ezemvelo KZN Wildlife Manager of Imfolozi Wilderness Trails and the park secretary/administrator. Whilst this was a small group, it encompassed a broad experience base so there was empathy for, and direct experience of, the diverse objectives of the wilderness area. No one at the meeting was trying to push a particular viewpoint by railroading others; there was a very real sense of the participants wanting to accommodate alternative viewpoints and a desire to distil, retain and include the essence of each of the stakeholders' submissions. Most importantly, each participant of that meeting arrived with his or her own idea of what the zonation should be and it is important to note, from Tables 28 and 29, that the final zonation is different from each of these. This was due largely to the subtle application of the U-curve (Senge *et al*, 2004) within the structure of the meeting in which pre-conceptions were released prior to some deeper probing of the issues and a thorough exploration of alternatives.

The scrutiny of Tables 27 and 28, along with the points listed above, reveal three trends within the submitted zonation allocations. The first two of these (below) mirror the wilderness management debate as highlighted by Cole and Hammitt (2000):

- Prioritizing the area's naturalness and hence applying a zonation allocation that allows for mandated management interventions; this stance is epitomized by the submissions of the Anti-Poaching Unit and Game Capture (see Table 27) whose priorities are obviously to carry out their respective functions without oppressive restrictions.
- Prioritizing the wildness of the area where regulation and management intervention is minimized: the allocation of *Imfolozi Wilderness Trails* (the Ezemvelo KZN Wildlife's wilderness trails team) epitomizes this emphasis (see Table 27), where security and management activities would be subject to the severe restrictions imposed by the abundance of Primitive WMAs but the restrictions to wilderness trail activities, through pristine classification, are only applied to two of twelve WMAs and one of those seldom sees wilderness trail activity (see Figure 27). Like Game Capture and the Anti-Poaching Unit, the motivation behind the zonation allocation of the *Imfolozi Wilderness Trails* team is related to the type of work that they do in the wilderness area; if the work performed by wilderness trails guides is to facilitate shifts in consciousness of trail participants as a consequence of them experiencing wilderness directly (see Section 3.8.1), then the boundaries of human behaviour are best set by the wilderness itself (Patterson *et al*, 1998) and not by imposed management regulations.
- Cole and Hammitt (2000) point out that it is impossible to manage a wilderness area to be simultaneously wild and natural and that these characteristics need to be prioritized and emphasized within the management strategy. This is the attempt of the third orientation of zonation allocations, where the necessity of management intervention is recognized but the amount and type of intervention is itself strictly regulated. With more WMAs being zoned as pristine, these allocations prioritize the naturalness of the area but they send a message to both users and managers that they must acquire the skills and tools to perform their activities with the minimum of impact. This stance was emphasized by people who were and/or are very familiar with the Imfolozi Wilderness Area and its

management: Jim Feely and Craig Reid (both ex-managers and ex-wilderness guides), John Forest (ex-manager) and Bruce Dell (ex-wilderness guide).

Submissions from the Wilderness Foundation, the Wilderness Action Group, the Endangered Wildlife Trust, the Wilderness Leadership School and freelance wilderness guides (see Table 27) tended to reflect current conditions in the wilderness area. This is encouraging because it indicates that the NGO sector (which can fulfill a watch-dog role regarding standards) is satisfied with the *status quo*. The similarity of their submissions to existing conditions within the Imfolozi Wilderness Area has appeal because fewer procedural or operational modifications are necessary to align existing conditions with the required standards. This was undoubtedly a strong motivating factor behind the initial submissions emanating from the project management team itself (see table 28), zoning the wilderness area so that the current situation is considered satisfactory rather than zoning it for desired higher standards which would require financial and human resources that are not readily available.

#### **4.8 –RESULT OF STEP 9 – THE SELECTED ZONATION ALLOCATION**

(Referred to in Sections 3.12 and 5.7)

On deeper reflection, it was assessed that the type of thinking epitomized by the initial submissions of the project management team (Table 28) was putting the cart before the horse and that whilst the ideology behind the zonation will be affected by the availability of human and financial resources, these should not be the primary determining factors. For this reason, the project management team used the submissions of the Wilderness Leadership School (WLS), Wilderness Action Group (WAG), the Wilderness Foundation (WF) and the Endangered Wildlife Trust (EWT) as a basis from which to work and then re-oriented the zonation to include the submission of the Council for Traditional Healers which advocated peripheral development and the ex-managers and wilderness guides with their strong emphasis on managing managers.

The monitoring data from Step 5 (particularly that pertaining to the positioning of management activities and base camps within the wilderness area) ensured that the WMAs on the edge of the



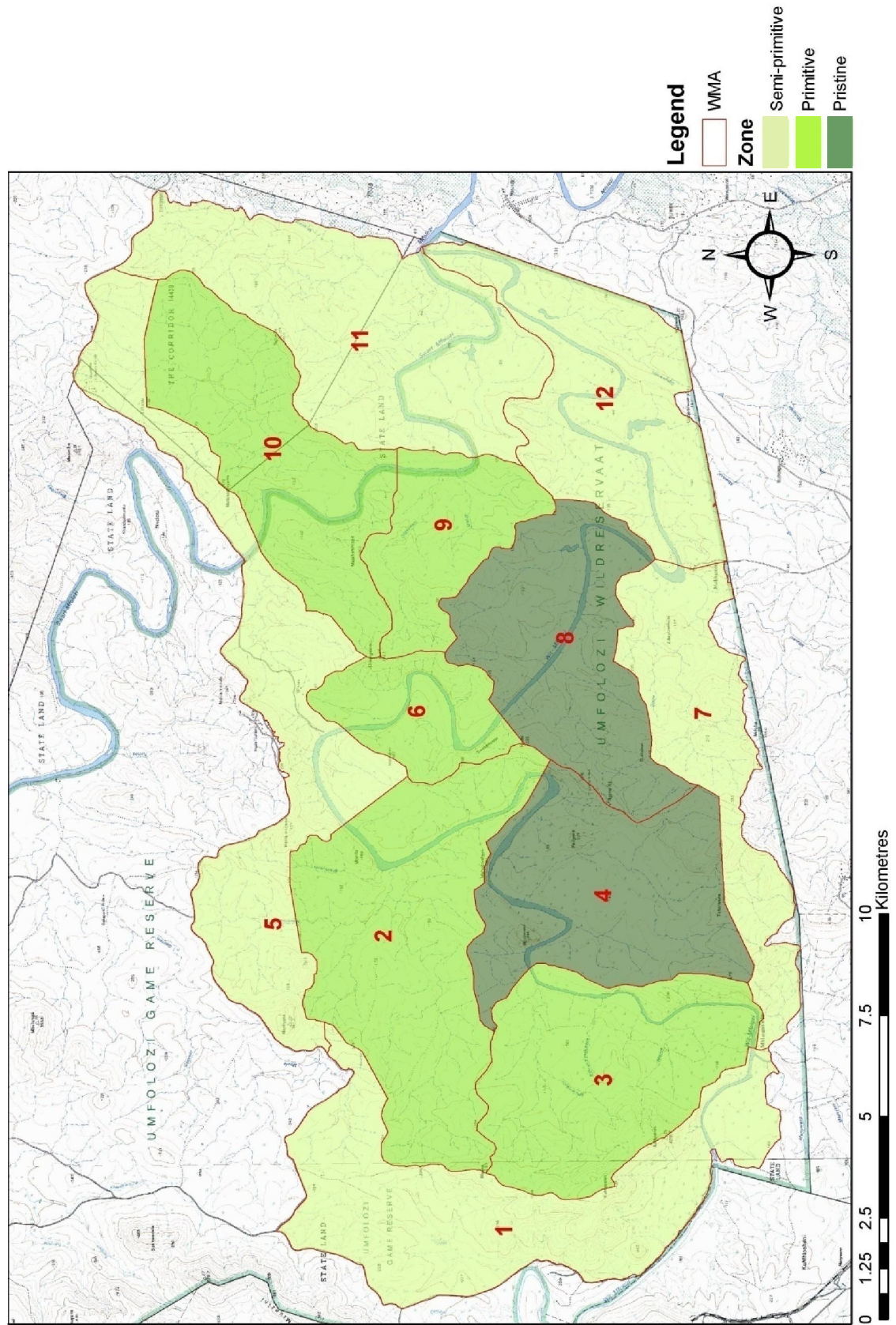
wilderness area were zoned as Semi-Primitive (see the submissions of the WLS, WAG, WF, and EWT in Table 27). There was strong support for the pristine zonation of WMAs 3, 4, 8 and to a lesser extent 6 and 9 (see the submissions of Dell, Feely, Forest and Reid in Table 27). The view shed analysis (Appendix 2) rather than the light pollution data from Step 5 revealed that WMAs 3, 8 and 9 were severely affected by external light pollution, although the area affected by light pollution in WMA 8 is largely forested. Because the visibility of external human habitation is one of the defining characteristics of the zonation categories (see Table 19), areas 3 and 9 were excluded from Pristine classifications.

Impacts to the wilderness area from educational and recreational activities are clearly evident in the data (see Tables 21 and 22a-f as well as Table 21 for Mdindini Base Camp). This is not only illustrated in the map showing area usage by the WLS and Ezemvelo KZN Wildlife's wilderness trail operation (Figure 27), but also evident from the indicators depicting litter (Figure 22), bare ground (Figure 25), human made paths (Figure 26) and the vestiges of disturbance (Figure 23). Although there are no reliable data depicting the number of human encounters, the amount of human traffic as a result of the trails operations could justify semi-primitive classifications being attributed to areas 2, 6, 9 and 10. But the emphasis towards stricter categories of protection, evident in the submissions of both trail organizations, justified the primitive zonation of these areas. The selected zonation allocation is recorded in Table 29 and depicted in Figure 29 (below).

**Table 29 – The selected zonation categories for the Imfolozi Wilderness Area**

	Zonation Category for WMA 1	Zonation Category for WMA 2	Zonation Category for WMA 3	Zonation Category for WMA 4	Zonation Category for WMA 5	Zonation Category for WMA 6	Zonation Category for WMA 7	Zonation Category for WMA 8	Zonation Category for WMA 9	Zonation Category for WMA 10	Zonation Category for WMA 11	Zonation Category for WMA 12
Final Zonation	Semi- primitive	Primitive	Primitive	Pristine	Semi- primitive	Primitive	Semi- primitive	Pristine	Primitive	Primitive	Semi- primitive	Semi- primitive

**Figure 29 – Map showing the Zonation of the Imfolozi Wilderness Area**



#### **4.9 – RESULTS OF STEP 10 – IMPLEMENTING ACTIONS AND MONITORING CONDITIONS**

As soon as the zonation allocation had been selected it became evident that certain conditions in the wilderness area were exceeding the standards determined in Step 6 of the process. It was therefore necessary to implement management interventions to re-align conditions with the standards. The interventions that have been implemented so far are listed below.

1. The management intervention to prevent cut branches has been the banning of saws. Instances where the exceptions to this rule are applied (see Table 26) will be recorded and corrected. Fire wood is to be collected from fallen dead wood.
2. The *Makhamisa Top Primitive Camp* and the *Dadethu OP Site* (WMA 8 – Pritine) are being rested until further notice in order for the bare ground to recover.
3. The vehicle track to the *Imbiya Satellite Camp* will be closed and brush packed if necessary.
4. Parts of the *Mpafa Camp* have been brush packed as a result of exposed roots, noted in the first monitoring exercise in 2008.
5. The *Mqizweni Lion Call-up Site* (WMA 12) has been closed because it falls outside of the PMA.
6. The *Airstrip Buffalo TB Testing site* (WMA 10) is outside the PMA and has been closed. The track leading to it is being rehabilitated.

Ezemvelo KZN Wildlife has requested that the author co-ordinates the continuation of the wilderness monitoring process until April 2010.

## **CHAPTER 5 – FUTURE DIRECTIONS, RECOMMENDATIONS AND CONCLUSIONS**

As mentioned in the introduction, the sequential nature of the project's implementation necessitated the inclusion of some discussion between each of the LAC steps within the methods and results. This chapter avoids repetition of those points but rather focuses on the products of the action research process and explores some future possibilities and implications. Recommendations made throughout the dissertation are summarized in the last table.

### **5.1 – MONITORING METHODS AND PRACTICE**

One of the primary purposes of forming the Imfolozi Wilderness Management Forum, besides bringing together the active users of the wilderness area, was to create an efficient and cost effective means of conducting ongoing monitoring of all activities within the wilderness area. In spite of the LAC process being entrenched within the IMP, the impetus of monitoring will be dependent on a motivated Conservation Manager, in combination with active support from the Ecological Advice Division of Ezemvelo KZN Wildlife. While it is imperative that the costs of monitoring are minimized, it is essential for Ezemvelo KZN Wildlife to plan and account for the monitoring costs that will be incurred. What may aid the process will be the inclusion of other interested individuals and NGOs who could contribute to the logistics and funding of the monitoring process.

With regard to the monitoring practice, the indicators were selected to be as objective as possible, and easily measurable. Where monitoring involved input from a number of monitors, it became apparent that this was, in fact, the case. It would, however, be useful to formalize that observation by conducting an experiment where separate monitoring teams duplicate an extensive monitoring exercise so that their results can be compared (see Table 30).

## **5.2 – WILDERNESS MONITORING DATA BASE**

The implementation of the LAC process and the subsequent collection and interpretation of monitoring data for the Imfolozi Wilderness has, for the last three years, been prioritized by the project management team with its dedicated researcher. A valid question is – what happens after the implementation phase and after the researcher is no longer present to provide momentum? The first part of that question is answered by the fact that maintaining the standards of conditions within the wilderness area is specified within the IMP. This places authority and accountability with the Conservation Manager. What will make his/her job easier, in this respect, will be the rapid and efficient processing of monitoring information.

In accordance with the purposes of the Wilderness Management Forum, monitoring information will be received from a wide variety of sources throughout the year. The monitoring form is structured (see Table 13) to enable that information to be easily transferred into a database and because each column contains geographical coordinates that means that the monitoring data can be represented topographically. The plan is to create a database where the users of the wilderness area (wilderness guides, Section Rangers, capture officers, researchers etc) can send their monitoring data. This information will be collated by the Regional Data Base Manager so that the database automatically flags problem areas (when standards are exceeded) and makes this information available to the Conservation Manager and Section Rangers. The design of this database is currently underway and it is recommended that this work should be continued and implemented (see Table 30).

## **5.3 - THE RELEVANCE OF THE IMFOLOZI WILDERNESS AREA IN SOUTH AFRICA AND THE EXPANSION OF COMMUNITY INVOLVEMENT IN PROTECTED AREA MANAGEMENT**

In his paper *Radical American Environmentalism and Wilderness Preservation: a Third World Critique*, (1989), Ramachandra Guha has linked the preservation of wilderness with the developed world's response to its own excesses. These excesses have not only been instrumental in creating the impending global environmental crisis (including the decimation of the planet's

wild areas) but have also created - and continue to widen - the divide between the world's rich and poor. The *have-nots* of the developing world, as victims of imperialism (and more recently in South Africa, apartheid) have little connection with the cause of the problem and therefore have little empathy with one of its solutions – further human exclusion in the form of wilderness. David Johns (1990) agrees with Guha in saying that the socially unjust ontogeny of protected wilderness areas in the developing world has to be recognized by modern environmentalists but that this should not include the political perpetuation of unsustainable environmental and economic policies. He goes on to say that a healthy planet for human survival is one that is characterized by ecological diversity and that some of the indicative species of that diversity (lions, elephants and rhinos, for example) require habitat with minimal human disturbance. His point is that, regardless of the imperialist or elitist emergence of the wilderness concept in the 19<sup>th</sup> and 20<sup>th</sup> Centuries, wilderness has a brutally apparent social relevance to both the developed and developing worlds in the 21<sup>st</sup> Century: it is an ecological necessity. Whilst this debate is likely to rage on concerning vast areas of the planet's tropical jungles, alpine areas and tundra, it must be remembered that in South Africa the amount of land being allocated as wilderness is yet to reach 1% (Bainbridge, 2001).

That small allocation does not justify the continued exclusion of community involvement. Quite the reverse: the maintenance of such small pockets of wilderness is dependent on the surrounding communities contributing to their protection in two ways. The existence of those areas should have local significance; the communities surrounding the Imfolozi Wilderness have identified the area's spiritual and cultural significance (Ezemvelo KZN Wildlife, 2009a). This sentiment was confirmed by the contribution from the Council for Traditional Healers to the LAC public participation process of Step 7, illustrating that the 21<sup>st</sup> Century concept of wilderness is not merely a western construct. The limited access that people do have to that wilderness should be determined by local communities in conjunction with the relevant land management agency.

Second, whilst it may be difficult for local communities to derive direct economic benefit from the Imfolozi Wilderness Area itself, managing the surrounding land in a complementary manner could reverse the situation. The creation of community reserves with vehicular access (i.e. not wilderness) on the western, southern and even eastern boundaries of the park would accomplish three objectives:

- Provide areas where the community could manage and derive the benefits of ecotourism.
- Establish a protected buffer area around the southern portion of the wilderness area.
- Involve the local communities in rhino protection.

The creation of these reserves could perform another function: that of linking the Hluhluwe-Imfolozi Park to other protected areas. This possibility is currently being investigated by the author in conjunction with the Wildlands Conservation Trust. Currently, the land surrounding the Imfolozi Wilderness Area is being commercially mined or prospected; the 15-25 year life span of such developments could threaten long term environmental, social and economic sustainability (Wilderness Action Group, 2009).

#### **5.4 – RECOMMENDATIONS ON TERMINOLOGY**

If the concept of wilderness conservation is to have local South African relevance in the 21<sup>st</sup> Century, then something must be said about the terminology that is used to describe its management (see Section 2.1.5 of the literature review). As the processes and practices of wilderness management have evolved and spread, they have developed their own terminology, in addition to picking up terms from other management systems such as the Recreation Opportunity Spectrum. Abbreviations like ROS, WIMS, VERP and LAC have almost become words in themselves. To provide continuity and consistence, many terms within these systems have been perpetuated out of the circumstance in which they evolved so that their application under different spatial, temporal or cultural conditions is confusing to all but the few researchers and managers who have made themselves familiar with the terminology. Confusing terminology (even if it is consistent) will become counterproductive if it begins to impede the broader application of wilderness management systems. This became evident to the project management team in Imfolozi who were constantly reminded, for example, that there is no part of the Hluhluwe-Imfolozi Park that is *pristine*. Taking a planning and management system from the Bob Marshall Wilderness Complex and applying it 25 years later on the other side of the planet was bound to precipitate terminological issues. The successful application of LAC in the Imfolozi Wilderness Area stands as testimony to its soundness and perhaps it is time to celebrate

that broad applicability by recalibrating the terminology to fit the international conditions to which it is now being applied. This work does not presume to offer alternative terminology but rather to highlight certain terms that did cause confusion in the context of the Imfolozi Wilderness Area: for example, pristine, primitive, resource indicators, social indicators and opportunity classes.

## **5.5 - NATIONAL AND INTERNATIONAL PROCLAMATION OF THE IMFOLOZI WILDERNESS AREA**

As pointed out in the literature review (in Section 2.2), wilderness areas are not a type of protected area in South Africa but rather zoned portions within protected areas. Nevertheless, their designation is determined by the provisions of the Protected Areas Act (NEMPAA, 2003) and approved by parliament where after the wilderness management principles, documented in a management plan for the zoned area, effectively become law. The proclamation of the wilderness area in Imfolozi was prioritized at a public participation process for the management of the Hluhluwe-Imfolozi Park (Ezemvelo KZN Wildlife, 2009a). As this request from the public mirrors Ezemvelo KZN Wildlife's own policy (Ezemvelo KZN Wildlife, 1999), it compounds their responsibility to pursue this goal, initially at provincial level and then perhaps at a national level. It is recommended that the NGO sector assist in this task.

Separate to the legal proclamation of wilderness areas, the IUCN designates wilderness according to the management *intentions* for those areas. For the Imfolozi Wilderness Area, LAC has been implemented as a wilderness planning and management tool and that system has been written into the Hluhluwe-Imfolozi Park's management plan; this must surely meet the IUCN's criteria for illustrating a wilderness management intention. As mentioned in the literature review (in Section 2.2.4), the IUCN makes provision for parks to receive a split classification and it is recommended that Ezemvelo KZN Wildlife, in conjunction with the NGO sector, lobby to achieve this within the Hluhluwe-Imfolozi Park so that the wilderness area attains the category 1b and the remainder of the park retains its current category 2 status.



## **5.6 – SUMMARY OF RECOMMENDATIONS**

The table below lists the recommendations that have been made throughout this dissertation.

**Table 30 – Recommendations**

	<b>Recommendation</b>	Section in which it appears
1.	Formalizing relationships between users to implement monitoring and management actions: for example, trails groups assisting in the monitoring and management of alien plant clusters.	3.8.3
2.	Review the viewshed analysis of the park, looking at the worst-case scenario. In other words, how much external land (where a light could hypothetically be placed) is visible from within the Wilderness area?	3.8.3
3.	Develop standards for light and noise pollution. Apart from altering zonation it will be very difficult to align conditions with standards. The value of a standard is that it could limit future development that could create additional light and noise pollution	3.9
4.	Conduct research into human activities impacting on wildlife to delineate limits of acceptability and measure the advantages of management activities against the effects on the wildlife populations	4.4
5.	Periodic revision of the LAC process to coincide with the revisions of the IMP, starting with the inclusion of new stakeholders and the identification of evolving objectives, issues and concerns. The identification of new issues could require alternative indicators and a modified monitoring process. Revisions will ensure that the LAC process is being incorporated within an adaptive management system	4.2
6.	Ezemvelo KZN Wildlife to plan and account for the monitoring costs.	5.1
7.	The inclusion of other interested individuals and NGOs within the monitoring process who could contribute to the logistics and funding, as well as providing an independent watchdog role to align practice and standards.	5.1
8.	Conduct an experiment to compare the results of data collected from separate monitoring teams.	5.1
9.	When the monitoring system has been tested over time, an expansion of the <i>Wadge Index</i> (see Table 14 ) could include base camps and management sites, where acceptable conditions for these could be represented by the indices <i>Id</i> and <i>Ie</i> respectively.	3.9
10.	The indicator of human made paths should be addressed in the next review of the LAC process	4.4
11.	Implement the use of a wilderness monitoring and management database	5.2
12.	Conduct research into standardizing the terminology that is used to describe wilderness management systems around the world.	5.4
13.	Pursue the highest level of legal protection for the Imfolozi Wilderness Area	5.5
14.	Pursue recognition from the IUCN for the management intentions of the Imfolozi Wilderness Area and lobby for a split classification of the Hluhluwe-Imfolozi Park as Category 2 and Category 1b.	5.5

## **5.7 – CONCLUSION**

The opening sentence of Chapter 1 defines the aim of this work to be *the implementation of a collaboratively established management system that enables the monitoring and mitigation of human influences on the wilderness area of the Hluhluwe-Imfolozi Park.*

To achieve this, the project made use of the *Limits of Acceptable Change* process, an internationally accepted planning and management system which actively engages with stakeholders, many of whom have very diverse interests in the Imfolozi Wilderness Area. Stakeholder input was incorporated through additional public participation processes, beyond those required by law. But by dovetailing with the requirements of the Integrated Management Plan and South African environmental legislation, the Limits of Acceptable Change system clarifies authority and accountability, thus empowering Ezemvelo KZN Wildlife to make defensible wilderness management decisions.

By focusing on both Ezemvelo KZN Wildlife's mandate to manage the wilderness area and the input received from stakeholders, a monitoring system was established that is streamlined to address the specific issues of the Imfolozi Wilderness Area. The *Wilderness Management Forum*, a body made up of managers and users, was formed to aid in communication between wilderness users as well as to carry out the monitoring process in a cost effective and transparent manner. This resulted in the first comprehensive survey of human impacts.

The results of the monitoring exercise led to the generation of a set of standards that defined acceptable levels of human impact in the wilderness. The collaborative application of these standards to the appropriate regions within the wilderness area resulted in an updated and practical zonation. That new wilderness zonation has been included in the latest draft of the Hluhluwe-Imfolozi Park's Integrated Management Plan. When that document is ratified by the Member of the Executive Council of the provincial parliament, the Imfolozi Wilderness Area will receive its first legal protection since it was designated 50 years ago.

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<http://uwspace.uwaterloo.ca/bitstream/10012/3036/1/CZ%20Thesis%20PDF.pdf> Accessed: 6/7/08. Page 13

### **CITED ACTS OF PARLIAMENT – SOUTH AFRICA**

Biodiversity Act. 2004. See *National Environmental Management: Biodiversity Act*.

*KwaZulu-Natal Nature Conservation Act* No.9 of 1997. Section 40(1) Pg19, Pages 23-25  
<http://www.enviroleg.co.za/provinces/kwazulu-natal/K-natman.pdf> Accessed 3 April 2008

*National Environmental Management Act* No. 107 of 1998. Gazette No. 19519 Vol 401. 27 November 1998.

*National Environmental Management: Biodiversity Act* No. 10 of 2004. Gazette No. 26436, Vol 467. 7 June 2004

*National Environmental Management: Protected Areas Act* No. 57 of 2003. Gazette No. 26025, Vol 464. 18 February 2004. Section 26 (1) (2) (a) (b) (c), Definitions, Pages 12, Sections 26 (2), 39 (1) (2) and (3), 9 (a)-(e), 41

NEMA. 1998. See *National Environmental Management Act*.

NEMBA, 2004. See *National Environmental Management: Biodiversity Act*.

NEMPAA. 2003. See *National Environmental Management: Protected Areas Act*

Protected Areas Act. 2003. See *National Environmental Management: Protected Areas Act*.

## Appendix 1

An example of a wilderness monitoring exercise: conventional capture  
of black rhino where the extraction took place beyond the boundary of  
the Peripheral Management Area  
29 September 2007

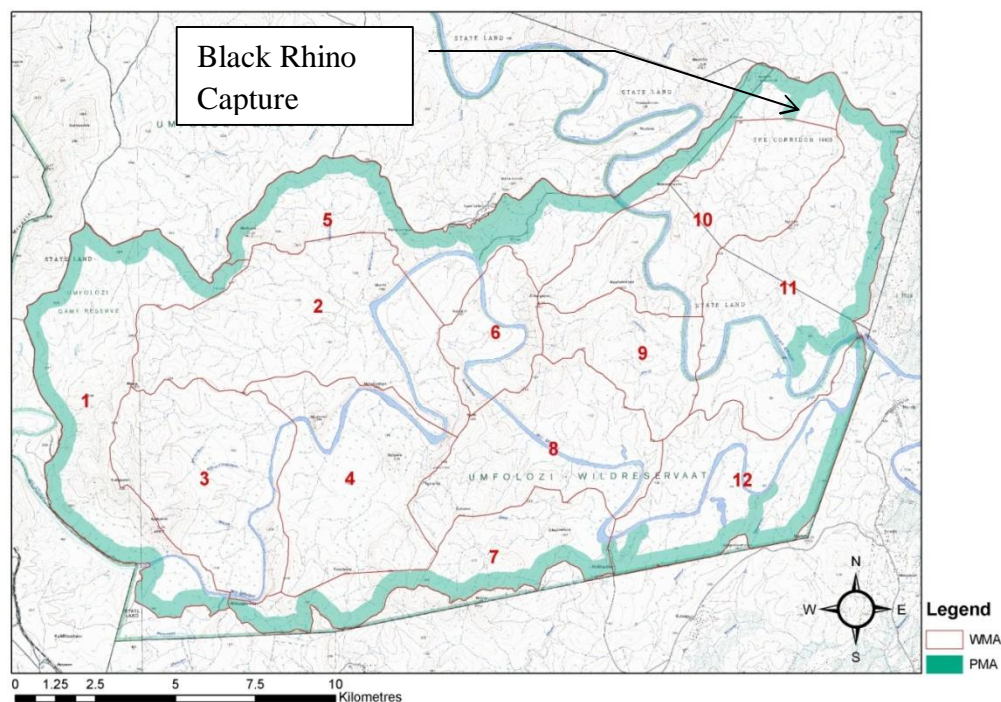


## Wilderness Management/ Monitoring/Exceptional Capture Site

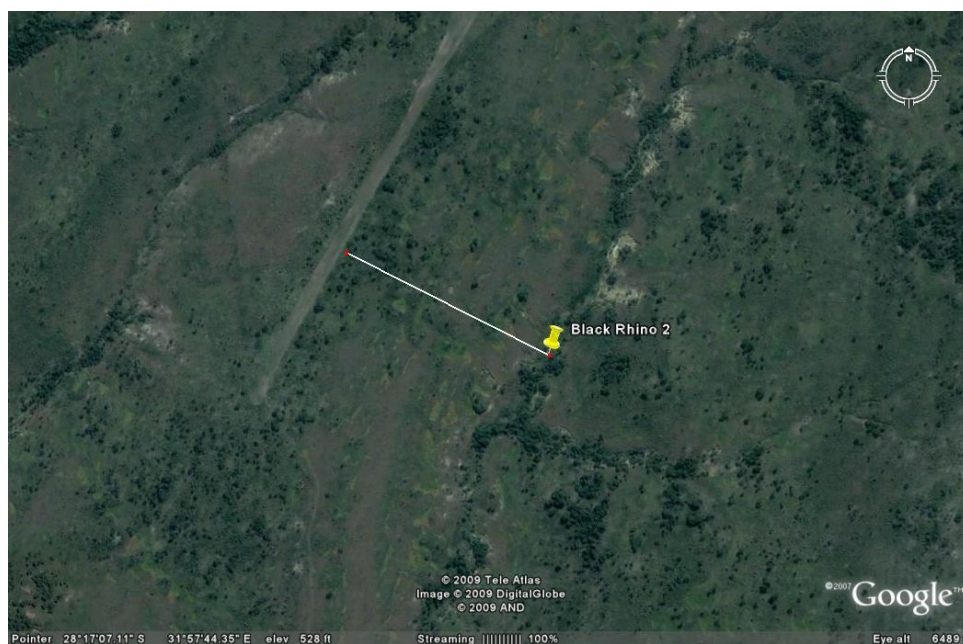
For use when the loading site for conventional capture occurs within the wilderness area beyond the boundary of the Peripheral Management Area.

Date: <i>29 September 2007</i>	Time of capture (completion): <i>11h40</i>								
GPS coordinates of animal: <i>28.28588S 31.96434E</i>	GPS coordinates of loading site (if different): <i>28.28587S 31.96359E</i>								
Wilderness Management Area number: <i>5</i>	Distance between loading site and wilderness area boundary <i>865m</i>								
Motivation for exceptional capture site: <table border="1"><tr><td>Risk to animal</td><td><i>X</i></td></tr><tr><td>Risks associated with walking the animal</td><td></td></tr><tr><td>Capture of a specific individual</td><td></td></tr><tr><td>Other (specify)</td><td><i>X</i></td></tr></table>		Risk to animal	<i>X</i>	Risks associated with walking the animal		Capture of a specific individual		Other (specify)	<i>X</i>
Risk to animal	<i>X</i>								
Risks associated with walking the animal									
Capture of a specific individual									
Other (specify)	<i>X</i>								
Specific circumstances: <i>1. The animal went down in a gully and may have injured itself if not guided</i> <i>2. The collection site was only 490m away from the edge of the airstrip and at the time of this capture, that was permissible.</i>									
Section Ranger: <i>S. Ras.</i>	Capture Officer: <i>J. Cooke</i>								
Veterinarian: <i>D. Cooper</i>	Monitoring Officer: <i>P. Cryer</i>								

**Figure A1.1 – Imfolozi Wilderness Area showing Peripheral Management Area (PMA) and position of monitored conventional black rhino capture**



**Figure A1.2 - Google Earth image showing the black rhino capture site being 490m from the edge of the air strip**



**Figure A1.3 - *Google Earth* image showing the black rhino capture site being 865m from the edge of the wilderness area**



**Figure A1.4 – Showing where the darted black rhino came to rest**

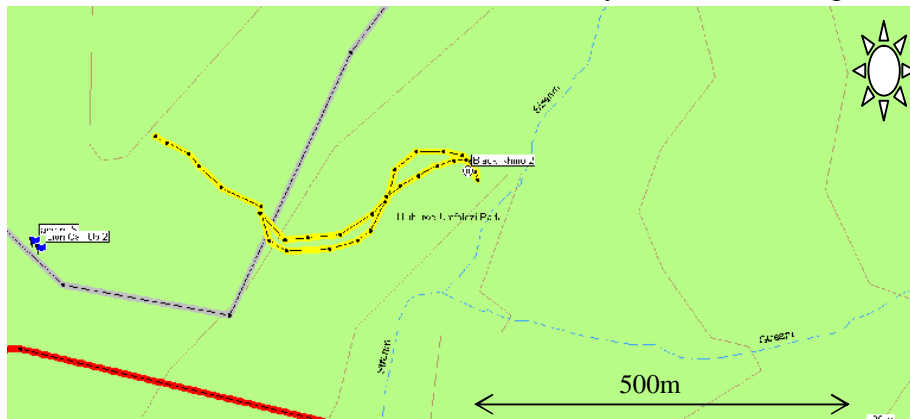




**Figure A1.5 – Section Ranger Sanmarie Ras and Section Ranger Emile Smidt at the capture site**



**Figure A1.6 – showing a GPS image from *Garmin MapSource*.** The red line indicates the boundary between WMA 5 (Semi-primitive), where the capture took place and WMA 10 (Primitive) to the south (see Figure A1.1). The purple line denotes the boundary of the PMA. The yellow line shows the route that the vehicle took (from the edge of the airstrip and out of the PMA) to extract the sedated rhino, measured by the GPS tracking tool.



**Figure A1.7 Sowing Section Ranger Emile Smidt recording the route of the vehicle after the capture operation.**

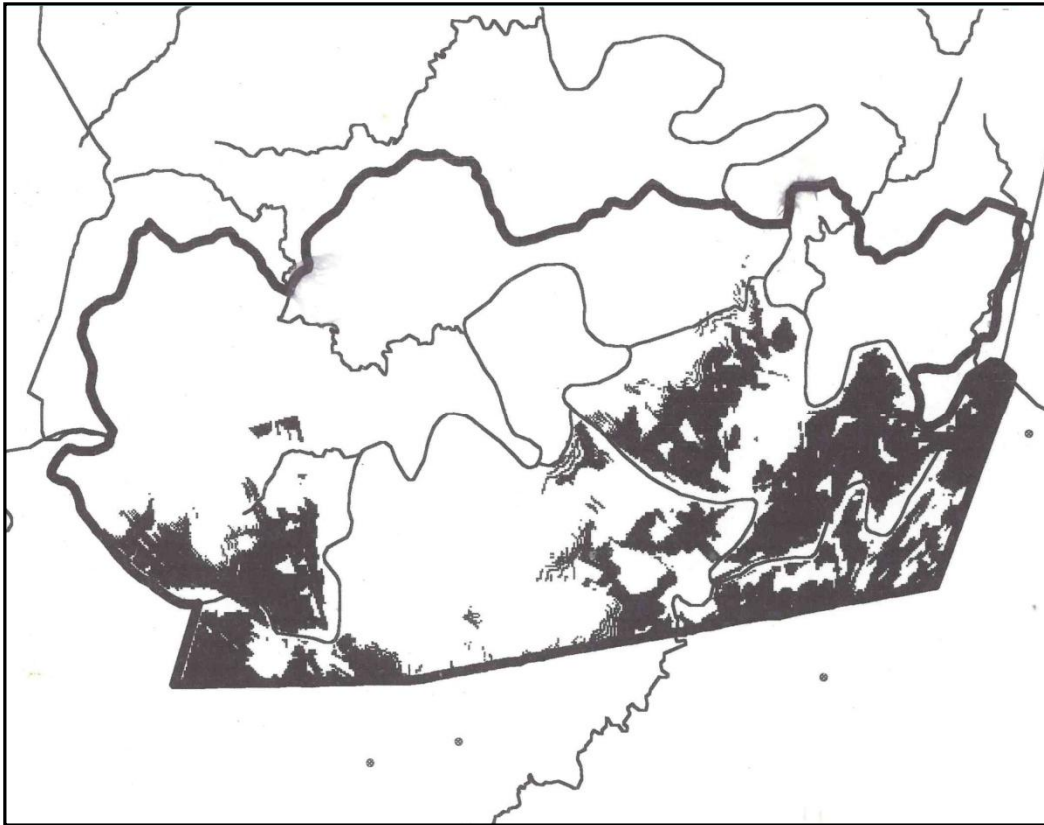


## Appendix 2

### Viewshed of Wilderness from External Developments 1999

**Figure A2.1 – Viewshed of wilderness from external developments.**

The four dots to the south and east of the wilderness area represent the main development nodes that were known to impact the wilderness area. The shaded area denotes those parts of the wilderness area from which the development nodes can be seen. The map assumes that both that the viewer and viewed areas are at ground level without the possibility of vegetation obscuring views. The map does not appear to include views beyond a distance of 12km.



Map compiled in 1998/1999 by Owen E. Howison, Research, Hluhluwe, Ezemvelo KZN Wildlife, PO Box 25 Mtubatuba, 3935

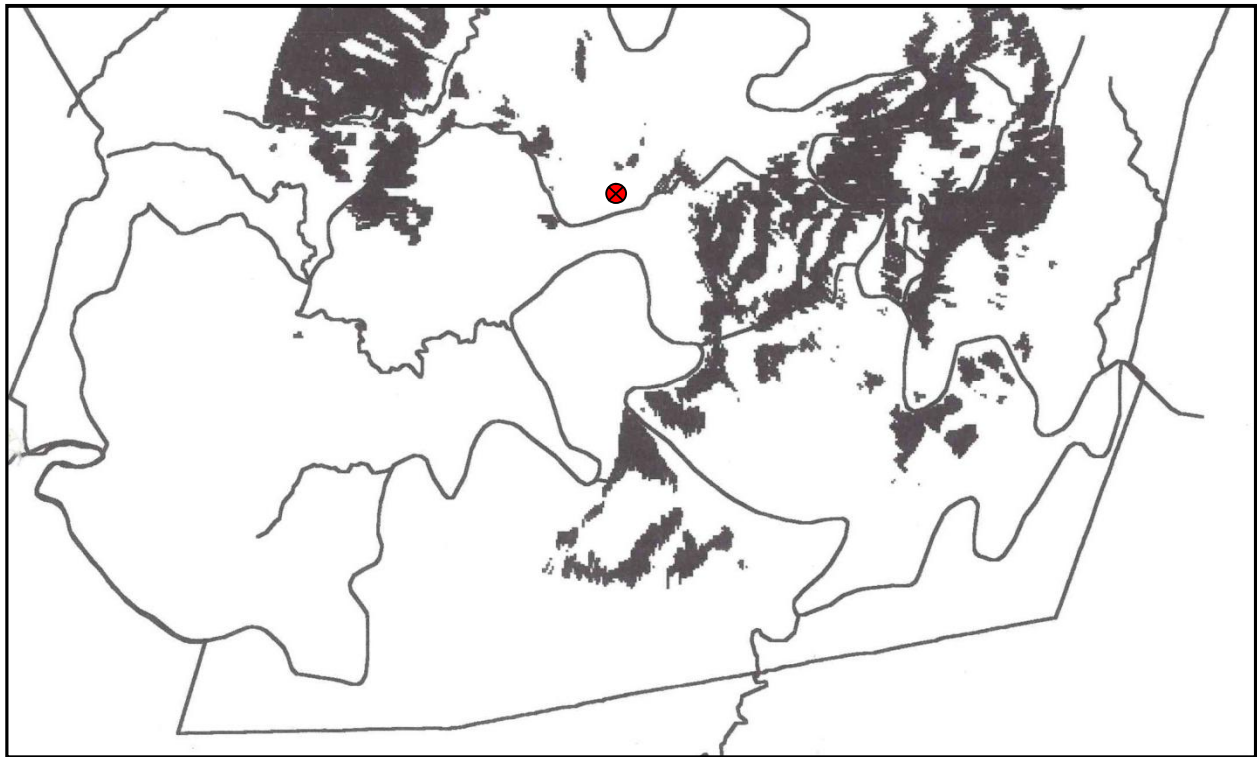
## Appendix 3

### Light Pollution from Mpila Camp on the Imfolozi Wilderness Area



### Figure A3.1 – Viewshed from Mpila

The shaded area denotes those parts of the wilderness area from which the Mpila Camp (denoted by the red dot) can be seen. The map assumes that both the viewer and viewed areas are at ground level without the possibility of vegetation obscuring views. The map does not appear to include views beyond a distance of 12km.



Map compiled in 1998/1999 by Owen E. Howison, Research, Hluhluwe, Ezemvelo KZN Wildlife, PO Box 25 Mtubatuba, 3935

### Exercise to determine which lights at Mpila are most visible from the wilderness area

On the 9<sup>th</sup> of September 2008, an exercise was conducted to determine which of the lights at Mpila are most visible from the wilderness area. This involved a coordinated effort on the part of the Imfolozi Management Team with the trails staff of both Ezemvelo KZN Wildlife and the Wilderness Leadership School adding support (see figure A3.2).

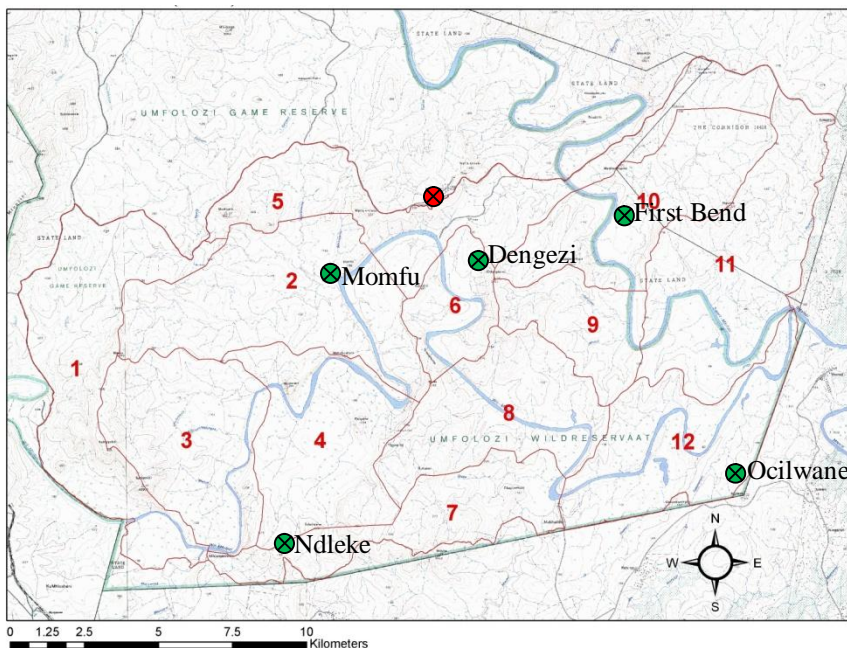
**Figure A3.2 – Conservation Manager Dave Robertson (second from the left) coordinating the positioning of the spotters for the evening exercise**



Photo: P. Cryer

Spotters were positioned at various points within or on the edge of the wilderness area (see Figure A3.3). A based team at Mpila Camp then went from building to building turning individual lights on and off one at a time. By communicating with the spotters on radio the ground team could determine which lights were visible. This exercise was aimed at benefiting wilderness users so the spotters were to be positioned at places used on wilderness trails rather than the highest points in the wilderness area

**Figure A3.2 – Map of the Imfolozi Wilderness Area showing the position of Mpila Camp (red spot) and the position of the spotters (green spots)**



**Table A3.1 - Results**

Mpila Light Pollution Data																																				
Light source/ Viewing Point	Gareth's main broom	Gareth's spareroom	Gareth's lounge	Cottage 15 - inside	Cottage 14 - o/side	R. Hut 12 inside	R. Hut 12 o/side	Chalet 21 inside	Chalet 21 o/side	Chalet 20 inside	Chalet 20 - o/side	Chalet 19 - o/side	Chalet 18 - inside	Chalet 18 - o/side	Chalet 16 - inside	Chalet 16 - o/side	R. Hut 5 - inside	R. Hut 2 inside	HMM - lounge	T.O. - bedroom (Snothi)	T.O. - main bedroom (Snothi)	TMiMf- o/side lounge	TMiMf- inside lounge	TMiMf- main bedroom	TMiMf- main bedroom green globe	Sec - o/side	T.O. - o/side far (Duncan)	T.O. o/side veranda (Duncan)	T.O. - lounge (Duncan)	OiC office	CMI - Rondavel	CMI - back door	CMI - sliding door	CMI - lounge	CMI - garage	
A (First Bend)	-	-	-	✓	x	✓	✓	x	x	x	✓	x	✓	✓	x	x	x	x	x	-	-	x	x	x	x	-	x	x	x	x	x	x	x	x	x	x
B (Dengezi)	x	x	✓	x	✓	✓	✓	✓	✓	✓	x	✓	x	x	x	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	x	x	✓	✓	✓	✓	x
C (Ndleke)	x	x	x	x	x	x	x	-	-	x	x	x	-	-	x	x	-	x	x	x	x	✓	✓	✓	-	x	x	x	x	x	x	✓	✓	✓	✓	x
F (Ocilwane)	x	x	x	✓	x	x	x	✓	✓	x	✓	✓	x	x	✓	x	x	✓	x	?	?	?	?	?	?	?	?	?	?	?	x	?	?	?	?	?
G (Momfu)	x	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓	✓	✓	✓	x	

### Key

Light visible - ✓

Light not visible – x

Viewer did not respond - -

Viewer could not see due to weather - ?

Copy of the email from the Conservation Manager to the Camp Manager regarding light pollution

From: Dave Robertson [robertsd@kznwildlife.com]  
Sent: Monday, August 31, 2009 9:57 PM  
To: Welile Mtshali  
Cc: Kim Gillings; Paul Cryer  
Subject: Actions from WASC meeeting

Hi Welile.

There were some actions from the iMfolozi Wilderness Area Steering Committee meeting on the 6th March which concern Mpila camp. The first was that all spotlights utilised by the night drive operator(s) should have red covers over the lenses. This is less intrusive for the animals, and is far less visible from the wilderness area, especially when people shine the spotlights up into the air!

Secondly, the meeting requested that the bright green light at Masinda Lodge be removed, as this was very visible at several points in the wilderness.

Lastly, we are trying to cut down light pollution as much as possible. While we haven't identified all the offending lights, the one at the front of the Gazebo seems to be one of the most visible from the wilderness, and I would ask that you try to shield this in some way that it still gives light, but this doesn't shine directly out to the wilderness. I know that you are in the process of putting up electric wire to keep the elephants out of the camp, and I think that this would give the perfect opportunity to plant some trees which, being now safe from elephants, could grow and help shade some of the lights.

Thank you  
Best regards  
Dave

## Appendix 4

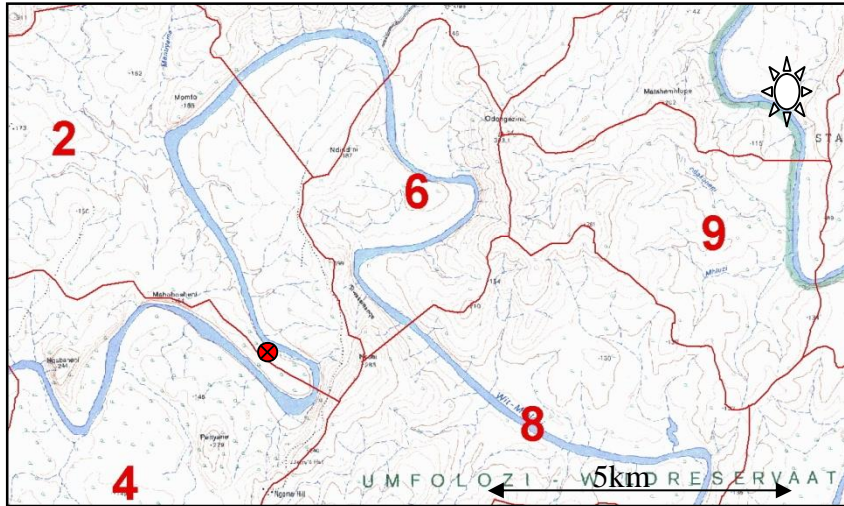
Example of a Monitoring Exercise that was conducted prior to the final selection of indicators



## **DATA SHEET FOR MAHOBOSHENI FOREST CAMP**

The camp is an infrequently used primitive trails camp. It was used twice in 2007 and two or three times in 2008.

**Figure A4.1 – Showing the position of the Mahobosheni Forest Camp (red dot)**



**Figure A4.2 – A primitive trail making use of the camp in 2007.**



Photo: WLS

**WILDERNESS AUDIT FORM**

Date <u>26/8/07</u>	Number <u>WMA 2</u>
Auditors <u>P. CRYER.</u>	
Location <u>MAHOBOSHANI FOREST 28.36734S 31.83748E</u>	
Wilderness Activity <u>PRIMITIVE TRAILS CAMP</u>	

Description	Condition Class	Comments
Central Area (fire/kitchen)	<u>/</u>	
Sleeping Area	<u>/</u>	
Toilet Area	<u>/</u>	
Shower Area	<u>/</u>	
Ash pit	<u>/</u>	
Paths	<u>/</u>	<u>None vis</u>
Firewood Collection	<u>/</u>	
Overall Condition Class	<u>/</u>	

**General Comments**

THE SITE HAD BEEN FLASHED BY ELKS.  
NO SIGNS OF PREVIOUS KITCHEN. ANIMAL  
BATH ABOUT CAMP WAS WELL USED.

**Recommendations or Remedial Steps Required**

/

**Date by which Recommendations Are to be Implemented**

/

**Figure A4.3 - Monitoring photograph of the Mahobosheni Camp in 2007**

**FIXED POINT PHOTOGRAPH Mahobosheni Forest Camp**

Type: Primitive Camp      Location: 28.36734 S/31.83748E

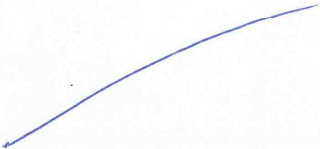
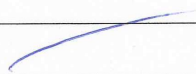
Date: 26/8/07      Direction from N: 180      Height: 1.7m

Focal length: ?      Configuration: Nikon Digital 5M





**Table A4.2 – Copy of the April 2008 Wilderness Audit form for the Mahobosheni Forest Camp**

WILDERNESS AUDIT FORM FOR CAMPS		
Date <i>18/4/08</i>	Auditors <i>E. SMITH &amp; P. CRYER</i>	
Location (Grid Reference, Wilderness Management Area Number and Description) <i>MAHOBOSHENI FOREST CAMP. 28.36734 S</i> <i>WMA 2 31.83748</i>		
Wilderness Activity <i>PRIM CAMP</i>		
Description	Condition Class	Comments
Central Area (fire/kitchen)	<i>1</i>	
Sleeping Area	<i>1</i>	
Toilet Area	<i>1</i>	
Shower Area	<i>N/A</i>	
Ash pit	<i>N/A</i>	
Paths	<i>1</i>	
Firewood Collection	<i>1</i>	
Overall Condition Class	<i>1</i>	
General Comments  <i>No Vix signs → are dryer. less cover but no bare patches.</i>		
Recommendations or Remedial Steps Required  <div style="text-align: center; height: 100px;"></div>		
Date by which Recommendations Are to be Implemented <div style="text-align: center; height: 40px;"></div>		
Include diagram of camp on the reverse side (Include measured distances, orientation, position and direction of camera for FPP)		Fixed Point Photograph taken? YES <input checked="" type="checkbox"/>

**Figure A4.4 – Monitoring photograph of Mahobosheni Camp in 2008**

**FIXED POINT PHOTOGRAPH Mahobosheni Forest Camp**

Type: Primitive Camp      Location: 28.36734 S/31.83748E  
Date: 18/4/08      Direction from N: 180      Height: 1.7m  
Focal length: 18      Configuration: Pentax K100 SLR/6M



**Figure A4.5 a, b and c – Wilderness guide clearing up a fire at the Mahobosheni Camp Site in 2007; the ash is mixed with the fire mound and then dispersed**



Photos: P. Cryer



## Notes

1. This site was also audited in Feb 08 with the same result as 07 one. Kim has the audit sheet.
2. In spite of there being another more regularly used primitive campsite only 100m away, fire wood depletion was not discernable. Both years showed considerable ele damage
3. The kitchen sit in this camp had been moved about to reduce impact. It worked because neither area had bare ground but it makes photographic monitoring difficult.
4. When it's not raining groups will use the rock ledge (100m away) so this spot gets used in periods when its recovery will be accelerated by the rain. Alternatively a kitchen area can be severely impacted if it is churned into mud
5. No litter in either audit but I can still see signs of use. Staff can see it more plainly than trailists. Separate indicator maybe?
6. The fixed point photographs are not taken from the same spot; in 2007 I didn't photograph the position of the photographer like in Feb
7. No sign of stumps anywhere.
8. One of the paths on top of the ridge looked as if it might have been a vehicle track (culls? Surely not. Maybe the water cart track from Ngome crossed the river. Ask Jim).
9. Mpila lights visible beyond Mdidini but you have to go back from the trees or down towards the river to see them. No other lights.
10. Didn't hear the train or anything else.