MARINE RESOURCE UTILISATION: THE PERCEPTIONS OF STAKEHOLDERS REGARDING CRAYFISH HARVESTING AT MFAZAZANA, KWAZULU-NATAL

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ABSTRACT

The illegal sale of East Coast rock lobster (*Panulirus homarus*) along the N2 highway at Mfazazana on the south coast of KwaZulu-Natal, continues to create tension between the local community and conservation and other authority structures in the region. *Panulirus homarus* (*P. homarus*) is a valuable commodity in an area distant from industry and other economic prospects and is within easy reach of both the harvester, in terms of its intertidal living space and the market, in terms of the N2 and the economy in seafood prevalent in the region. *P. homarus* is therefore at risk by virtue of its biology and habitat, and the illegal nature of its capture tests the parameters of sustainable resource management still further. This research addresses the issue of sustainable resource use through an examination of the perceptions of the various stakeholders who are involved in the use and protection of *P. homarus* at Mfazazana.

This study was commissioned by the Communications Section of the KwaZulu Department of Nature Conservation (KDNC) in response to continued illegal harvesting and trade of *P. homarus* at Mfazazana. One of the mandates of the Communications Section is to initiate and maintain environmental education programmes and thus comply with the KDNC mission statement (See Appendix 1a). Specific objectives of the study include:

- how respondents perceive their relationship with, responsibility to and role in terms of *P. homarus*
- how respondents perceive their relationship with, responsibility to and role in terms of the others involved with *P. homarus*
- how present legislation is perceived by stakeholders
- what options exist regarding the regulation and/or management of *P. homarus*
- whether changes over time have occurred in the respondents' relationship with *P. homarus*

Fishing and trading activities were investigated using informal, loosely structured questionnaires which elicited qualitative information. Two main groups were selected

and respondents were interviewed either individually or in small groups. The crayfishers made up the first group and the resource managers made up the second group which included the Natal Parks Board (NPB), the KDNC, the Hibberdene Tourism and Publicity Association, the Community Policing Forum, the Community Development Forum at Mfazazana and the South Coast Fishing Forum.

The study provided an understanding and explanation of how the elements of the locality interact with underlying structures and human agency in time to produce the conflict over the marine resource *P. homarus* at Mfazazana. It was found that the conflict between stakeholders, as a result of differing perceptions regarding the illegal harvesting of the resource, was obstructing the sustainable management of *P. homarus* at Mfazazana.

PREFACE

The main intention of this study has been to contextualize the problem of illegal harvesting of East Coast rock lobster (*Panulirus homarus*) and to elicit and analyse the perceptions of those stakeholders who impact on *P. homarus* at Mfazazana on the south coast of KwaZulu-Natal. As previous biological and sociological studies have been done, this opportunity allowed for a deeper examination of the research problem.

Minds are made up, decisions are reached and actions are taken based on perception of fact and rarely on fact alone. The continuing conflict between the different stakeholders, over the management of *P. homarus*, indicates that a new approach to the problem is needed. This research aims to expose the different perceptions which underpin the views and actions of the stakeholders regarding the illegal harvesting of crayfish at Mfazazana, thus facilitating the development of an education programme for the sustainable use of the marine resource.

The length of this thesis is in response to the action research which was applied in this study which will be used to further future projects in marine resource utilisation. This research had to look at all the stakeholders involved in the conflict and the complex nature of the situation in relation to the resource demanded a thorough examination and expression of the study of this conflict and its findings.

This research was commissioned by the Communications Section of the KwaZulu Department of Nature Conservation (KDNC). Funding for this project was provided by the KDNC, the Centre for Science Development (CSD) and the Research and Community Development Fund at the University of Natal. The conclusions drawn from this research do not necessarily express the views of the KDNC, the CSD or the University of Natal.

The study was concluded with a technical report being submitted to the KDNC, along with the other funders and a Master's thesis being submitted to the University of

Natal, Pietermaritzburg campus, in partial fulfilment of the University requirements for a Master's degree. It is hoped that the technical report will successfully facilitate the development of an education programme for the sustainable use of the marine resource *P. homarus* at Mfazazana.

The research was conducted and compiled by Jessica Rich, a Masters student at the School of Environment and Development at the University of Natal, Pietermaritzburg campus. This research was supervised by Dr. Dianne Scott and Ms Cathy Oelofse of the Department of Geographical and Environmental Science at the University of Natal, Durban campus. The geographical and biological components were reviewed by Alex Millar of the Natal Parks Board, Umtentwini. The interviews in Zulu were conducted and translated into English by Gugu Tsawulwayo. The Zulu translations were reviewed by Koekie Maphanga, researcher at the Institute of Natural Resources (INR), Pietermaritzburg.

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TABLE OF CONTENTS

LIST OF FIGURES, TABLES AND APPENDICES

LIST OF ABBREVIATIONS

CASE	Community Agency for Social Enquiry
CMAP	Coastal Zone Advisory Programme
HH	Household
INR	Institute of Natural Resources
KDNC	KDNC
KZN	KwaZulu-Natal
NPB	Natal Parks Board
ORI	Oceanographic Research Institute
P. homarus	*Panulirus homarus* (East Coast rock lobster)
Pers comm	Personal communication
RDP	Reconstruction and Development Programme
SAP	South African Police
SCUBA	Self Contained Underwater Breathing Apparatus
TLC	Transitional Local Council
UNP	University of Natal, Pietermaritzburg
WCS	World Conservation Strategy

CHAPTER 1. INTRODUCTION

1.1 Background to the study

The illegal sale of East Coast rock lobster (*Panulirus homarus*) along the N2 highway at Mfazazana near Hibberdene on the south coast of KwaZulu-Natal (KZN), continues to create tension between the local community and conservation and other authority structures in the region. *P. homarus* is a valuable commodity as a result of the economic opportunities it provides in an area distant from industry. *P. homarus* is within easy reach of both the harvester, in terms of its intertidal living space and the market, in terms of the N2 and the holiday makers who travel along it. *P. homarus* is therefore at risk by virtue of its biology and habitat and the illegal nature of its capture tests the parameters of sustainable resource management still further.

This debate over marine resource use at Mfazazana is neither new nor unstudied. A study was commissioned by the former Department of Development Aid to investigate the sociological and biological aspects of the harvesting, utilization and trade of *P. homarus* in the Mfazazana area (Schleyer, 1991 and INR, 1992). In addition, more recent biological surveys in the former Transkei and along the KZN south coast (Fielding et al, 1994 and Fielding, 1995) and sociological studies in the former Transkei (Kiepiel and Quinlan, 1995) relating to *P. homarus* have been conducted. And yet conflict over the use and management of the crayfish remains. Members of the Mfazazana community still sell East Coast rock lobster to passing motorists on the N2 and the sale of these crustaceans is still illegal. We have an impasse... or do we?

Research motivation

This research aims to examine the perceptions of stakeholders regarding crayfish harvesting at Mfazazana. This study has come about in response to concerns regarding the sustainable use of the marine resource *P. homarus* at Mfazazana by the Communications Section of the KwaZulu Department of Nature Conservation (KDNC). One of the mandates of the Communications Section is to initiate and maintain environmental education programmes and thus comply with their mission statement (See Appendix 1a). The selection of Mfazazana as the study area was perhaps most directly influenced by the flagrant breach of the law on the part of the sellers of *P. homarus* along the N2 at Mfazazana, as demonstrated with disturbing regularity to the various authority structures involved in its protection. Despite the potential for illegal harvesting opportunities elsewhere along the KZN south coast, a high number of contraventions continue to occur within or around Mfazazana (INR, 1992; Broker, 01/10/96; NPB, 1993-1994, 1994-1995). Within a broader context, this work falls within the clearly identified research needs of coastal zone management in the province (Shackleton, 1993, 1994). More than any other coastal region, the KZN coast is being subjected to rapidly increasing population pressure, thus requiring an integrated and structured approach towards coastal conservation.

The importance of interdisciplinary research

This study provides an understanding of how the tension between the constraints of the natural environment and the needs of the human environment is being played out at Mfazazana. To date this tension appears to be irreconcilable, and it is perhaps in response to challenges like these that debates around sustainable development have evolved. Kiepiel and Quinlan's work in the Transkei reflects the challenges brought about by the interdisciplinary nature of environment and development studies (1995, 1996; Quinlan, 1996). Research by Harris (1996) on the viability of community managed mussel bed programmes on the north coast between Mapelane Nature Reserve and Richard's Bay, may take us closer to real examples of successful sustainable use.

While this study and those by Kiepiel and Quinlan (1995, 1996) and Quinlan (1996) as well as by Harris (1996) differ in method as well as in purpose, a new approach to tackling issues regarding human interactions with the environment and rights over resources is evident. There is a recognition that the division of knowledge into separate disciplines may well be part of the problem in resolving the environment/development dynamic. Difficulties in working in the field of human-environment relationships appear to involve a difficulty in achieving synergy between different disciplines. The divisions between the natural and social sciences need to be breached if an understanding of human-environment relationships is to be achieved. It is in the spirit of integration that this study takes its direction.

1.2 Aim and objectives

Aim of the study

The aim of this study is to understand the conflict over the use of the marine resource *P. homarus*, through an examination of the perceptions of the major stakeholders at Mfazazana since: 'It is an established axiom that people tend to make up their minds on perception rather than fact. Although facts may prove otherwise, it is perceptions that count, as parties will act on their perceptions correct or not'(INR, 1992, preface).

Objectives of the study

The specific objectives of this study are to answer the following research questions :

1. How do the stakeholders perceive their role in terms of, relationship with and responsibility to *P. homarus*, as a marine resource.
2. How do the stakeholders perceive their role in terms of, responsibility to and relationship with the others involved with *P. homarus*, as a marine resource.
3. How do the stakeholders perceive the present regulation of *P. homarus*.
4. What options exist regarding the regulation and or management of *P. homarus.*
5. What change has occurred over time in the stakeholders' relationship to *P. homarus.*

While *P. homarus* is a species existing within a framework of physical constraints, its position as a marine resource necessitates an understanding of social conditions which impact on it. The nature of marine resources makes quantification difficult in any finite sense. The demands of marine research on predominantly terrestrial researchers in terms of oxygen and swimming ability make investigations of the marine environment difficult. These constraints on marine research has left the body of knowledge regarding these environments considerably impoverished in contrast to its terrestrial equivalents. These constraints on the quantification of marine resources lend further support to the qualitative approach to their protection proposed by this study.

1.3 Description of the resource and the various interest groups at Mfazazana

Panulirus homarus as a marine resource

The East Coast rock lobster or *Panulirus homarus* belongs to the decapod group of crustaceans. *P. homarus* occurs on rocky reefs in the surf zone at depths of 1-36m. The optimum depth range is 1-5 meters in terms of the high energy surf zone which is the favored depth range of the brown mussel (*Perna perna*), *P. homarus*' major source of food (Branch et al, 1994; Schleyer, 1991). *P. homarus* is found along the east coast of South Africa between Port Elizabeth in the south and Barra Falsa in the north (Fielding, 1995). Mfazazana is an area located about 5 kilometres north of Hibberdene on the KZN south coast (See Figure 2.2). Mfazazana is also the name given to the river which runs into the Indian Ocean and separates Mfazazana beach from Turton beach.

Mfazazana beach is made up largely of rocky shore formations and thus boasts the most abundant *P. homarus* population in the immediate region.

P. homarus is classed as a luxury food item and thus there exists a high level of demand for the resource by restaurants and hotels. An appropriately licensed individual may only catch and eat *P. homarus* as no commercial licence for this species exists. Competition with the West Coast rock lobster (*Jasus lalandii*), which currently costs in excess of R80/Kg and is a commercially licensed species, makes the local demand for the non-commercial *P. homarus* great. The commercial harvesting viability of the species is still under consideration (Fielding, 1995) though trawling would never be an option given the intertidal nature of the animal. Therefore any plans to licence *P. homarus* commercially is likely to remain at the artisanal and semi-commercial level. Current legislation limits capture methods to poling, the use of a pole to which bait is attached, and diving without SCUBA gear (Republic of South Africa, 1992, 81; Province of Natal, 1974, 229(1)).

The stakeholders involved with P. homarus as a marine resource

Under Apartheid legislation, Mfazazana was under the control of the KwaZulu administration. Despite changes in political dispensation since the elections in 1994, the legislation governing the capture and sale of *P. homarus* at Mfazazana remains the same. There are four primary authority structures which govern the marine resource *P. homarus* at Mfazazana: the KDNC, the Natal Parks Board (NPB), the South African

Police (SAP) and the Thulini Tribal Authority under Chief Luthuli. The KDNC is the conservation body of the former homeland of KwaZulu and the NPB is the conservation body of former Natal. Both agencies have joint, though split, jurisdiction at the provincial level over *P. homarus* at Mfazazana. The KDNC governs from the high water mark up to the N2 and the NPB governs from the high water down to the national water mark and on the N2 (See Figure 3.2). Neither agency has authority within each other's boundaries, despite a division in powers which accords the NPB law enforcement capacity in terms of conservation matters. The result of this partition in powers over *P. homarus* at Mfazazana, which is typical of the apartheid state, is an inadequately controlled marine resource. The SAP is a national body whose governance is applied in terms of law enforcement and protection of the marine resource as well as its users. Where the NPB is mandated with the provincial capacity to administer provincial conservation law, the SAP functions in cooperating as a law enforcement agency. This broad function may be largely due to the scope of SAP responsibility which precludes a detailed knowledge necessary to prosecute conservation offenders. The SAP's primary association then with the marine resource is on the N2 where the illegal crayfish market has resulted in conservation and traffic violations, public disturbances and homicide. The Thulini Tribal Authority is a district function which is not mandated with any legislated capacity. Its power lies in its relationship to the people who live in the Thulini district and the power accorded to the Authority by these people. At the de facto level of ordinance, the Tribal Authority plays a central role in the regulation of community affairs in an area which formed part of former KwaZulu. At this same de facto level, the Tribal Authority expresses its regulatory function over the marine resource

and the crayfish harvesters through the Community Policing Forum and the Community Development Forum at Mfazazana.

The other management structures which appear to impact most directly on *P. homarus* are the Community Development Forum at Mfazazana, the Community Policing Forum, the Hibberdene Tourism and Publicity Association and the South Coast Fishing Forum. The Community Development Forum at Mfazazana and the Community Policing Forum were both established in January 1995, under the mandate of the Government of National Unity (Rassenyalo, pers comm). The Community Development Forum is made up of Mfazazana residents and aims to identify and promote development objectives in the community in terms of the Reconstruction and Development Programme (RDP). *P. homarus* is identified as a community and development concern by virtue of the negative impact of the deaths on the N2 and the strained relations with the NPB and the SAP over the illegal nature of its capture. In a positive sense the potential income generated through the appropriate management of the resource is perceived as a matter of community interest. The Community Policing Forum, which meets at the Hibberdene Police Station, is made up of Mfazazana residents, members of the Hibberdene community, the SAP, the NPB and other interested and affected parties. This forum aims to address issues of crime affecting the different member communities and thus the illegal nature of crayfish harvesting and selling at Mfazazana is an area of this forum's concern.

The Hibberdene Tourism and Publicity Association consists of representatives from various Hibberdene residential communities, the SAP and other affected parties. As an

association, it aims to identify and promote tourism objectives for the Hibberdene area. The issues affecting Hibberdene, in former Natal, and those affecting Mfazazana, in former KwaZulu, are common as KwaZulu-Natal has found a new provincial footing and as tourism has become increasingly important in environment and development planning. *P. homarus* is thus of interest to environment and development planning in the region. The South Coast Fishing Forum is one of several Fishing Forums set up when the NPB was tasked with establishing what the needs and concerns of resource users are with a view to generating policy (Millar, pers comm). This task was set out by the Fisheries Policy Development Committee which reports to the Minister of Environment Affairs and Tourism. The Fisheries Policy Development Committee is assigned with generating fisheries policy which is appropriate and reflects the aims of the new political dispensation. *P. homarus* at Mfazazana is an important focus of the South Coast Fishing Forum as legislation aims to mandate sustainable use.

The crayfish harvesters are the last stakeholder group under discussion. They do not organize themselves in any formal way and are not directly represented by any group or on any forum to date. The harvesters' needs however are perhaps most closely articulated by M. Mthaka, an Mfazazana resident who is the popularly elected representative for the area on the South Coast Fishing Forum. These crayfishers have a material interest in their catch as sale of the marine resource provides valuable income to an otherwise impoverished stakeholder group.

The conflict over P. homarus as a marine resource at Mfazazana

The illegal sale of *P. homarus* at Mfazazana can be seen as occurring at the vortex of social, political, legislative and economic change and so acts as a symbol of the tension between conservation and development. The conservation authorities which operate in the region, the NPB and the KDNC, await imminent amalgamation. It is also a time of socio-political transformation in South Africa. The country's policy makers have moved into a new political dispensation and a new social order. The previous legislation left Mfazazana governed by the KwaZulu homeland administration which will remain in place until the new regulations of the province of KZN are enacted. This changing political climate has geographic and legislative implications which will be played out in different ways, one of which will be in terms of marine resource management. Until now, users of the marine resource *P. homarus* were exclusively defined by legislation as recreational fishers. Artisanal and subsistence fishers, whose parameters are still under discussion, have never been recognized as resource users and thus were always outside the law. With national as well as provincial environmental legislation under discussion, sports, artisanal and subsistence fishers may be legally recognized together for the first time. *P. homarus* has never had commercial status as its intertidal nature has precluded trawling and the known extent of the crayfishery has precluded sustainable commercialization. The redefining of regulation pertaining to *P. homarus*, may permit legal penetration of the market by commercial fishers for the first time. This would almost certainly entail the differentiating of access in terms of bag limits and conditions of sale to the marine resource by the different user groups which is likely to result in a two fold clash. Where recreational fishers compete for the same marine

resources as commercial fishers, relations between these fisher groups and between fishers and conservation agencies may be conflictual especially where development needs clash with the dictates of conservation.

The conflict at Mfazazana over *P. homarus* is the result of the different perceptions the various stakeholder groups have regarding the marine resource. Is it important to conserve this marine resource and if so why and by and for whom? In terms of the integrity of the natural system, *P. homarus* is important in the food chain which sustains life in terms of being simultaneously supported by and supporting of lower and higher life forms within it. Thus the dictates of conservation are contravened by the uncontrolled and unsustainable use of *P. homarus* by the crayfish harvesters at Mfazazana. However the development needs of an historically disadvantaged community also need to be taken into consideration. A growing population in a declining economy whose diminishing benefits are not equally accessed by all, puts pressure on the residents of Mfazazana at the most basic level of survival. The environment/development dynamic enacted at Mfazazana by the different stakeholders over *P. homarus* may be understood as a conflict in the priority and satisfaction of different needs. Conservation authorities perceive the protection of *P. homarus* as the primary concern in this conflict while the crayfishers perceive the protection of their income generated through the capture and sale of the resource as the primary concern in this conflict. The survival of the environment is pitted against the survival of the individual, while the survival of the first becomes confused with the survival of the second when brought down to the simple level of the food chain. At the level of perception, however, human and crayfish needs are fundamentally opposed as

satisfaction of each need necessarily precludes the satisfaction of the other in the short-term. As long as this opposition of needs remains in the perception of the stakeholders, the power of either environment or development over the other can only result in the impoverishment of both human and crayfish individuals and thus of the environment in the long-term.

This tension between environment and development is reflected by the differing perceptions of the various stakeholders and it is this which this study aims to examine. The views of officials of the KDNC and the NPB most clearly identify with the dictates of conservation while the crayfish harvesters at Mfazazana most clearly identify with the dictates of development. Between these two points on the environment/development continuum lie the other management groups. It is important to conserve the marine resource *P. homarus* and to meet the needs of development, a balance needs to be found if both systems are to be sustained. Thus the solution to this conflict needs to be negotiated between the stakeholders rather than imposed by the group with the most resources and power. This research aims to provide tools for resolving the conflict over *P. homarus* at Mfazazana. What remains unknown is whether resolution of difference through authentic negotiation can be achieved between the stakeholders. Should the resolution of the conflict instead remain in the realm of short term need satisfaction through an imposition of the powerful over the powerless, environment is likely to continue to be seen as opposed to development as the needs of one is brokered at the expense of the other. The value and utilization of the crayfish at Mfazazana are the central foci of the conflict between the community, the crayfish harvesters, the government and the conservation authorities. An understanding of society and space

in time, which provides the political, social and economic context of the conflict, is thus central to understanding the dissension here. This conflict may be representative of that found elsewhere across the country as development and environment struggle to find their uneasy truce.

Unless environmental education programmes are initiated in this area, with all the stakeholders, the present technocentric management of the marine resource will continue to be tested and ignored. The behavior of the stakeholders impacts on the management of these resources and it is only through a shift in people's perceptions, attitudes and behavior, that any real change will take place. the understanding gained from exploring the stakeholders' response to the resource can be used to inform the kind of environmental education programmes that need to be put in place.

1.4 An overview of the study

The study is organized according to the following structure. Chapter one contains the introduction to the research problem. Chapter two consists of the conceptual framework within which the research is examined. The biophysical, socio-economic and political properties of the locality of Mfazazana are investigated in chapter three. Chapter four consists of a presentation of the research design and methodology. The findings and analysis of the research data are presented in chapter five and the summary and conclusions of this research are found in chapter six.

CHAPTER 2. CONCEPTUAL FRAMEWORK

Introduction

Concepts and ideas developed within the framework of sustainable development are used as the theoretical basis for this research project. The field of sustainable development considers and debates how the conflict around environment versus development issues can be resolved. The conflict at Mfazazana reflects the need to conserve resources while still enabling people access to them in order to survive. The conservation bodies which manage this environment have to mediate and find solutions to the demands of both people and of the environment.

Sustainable development, as a concept, first began to emerge from ideas developed through the World Conservation Strategy (WCS) at the International Union for the Conservation of Nature in 1980 which argued from a dominantly biological environmentalist standpoint (Kirkby, O'Keefe and Timberlake,1995). The World Commission on Environment and Development (WCED), commonly known as the Brundtland Report, produced the key statement on sustainable development in 1987: 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (World Commisssion on Environment and Development, 1987, p.8). The concept considers futurity, ecological integrity, public participation and social equality and, in encapsulating the conflict between environmental dictates and development needs, it provides a way of understanding the human-environment relationships which are evident at

Mfazazana. Understanding how people relate to and value the environment is also critical to this research. Environmental perception theory will be used to gain insight into the human environment relations which are evident.

The following section examines the sustainable development paradigm. The origins of this body of ideas, its applicability within the developing world, local and international debates and the relationship between the paradigm and the environment/development debate will be discussed. The illegal crayfish harvesting at Mfazazana represents a conflict over the use and conservation of a marine resource. The existence of conflict over the resource and the human-environment relationships which exist in terms of who uses the resource, to what degree and how to regulate use to conserve the natural environment all represent issues which fall within the debate over environment and development. The discourse relating to sustainable development which assumes that both environment and development issues must be addressed in the resolution of conflict, is used to explain and understand the conflict at Mfazazana. Environment and development are therefore two sides of the same sustainable development coin.

A review of environmental ideologies presented here provides insight into the range of perceptions which people hold regarding human-environment relationships. This insight allows for the evaluation of the stakeholders' perspective regarding the use of the environment. These perspectives range from a belief that people have control over the environment and can use it as they wish; to a more accommodating 'wise use' approach; to an ecocentric approach which places people and the environment

as equal partners. Conflicting perspectives contribute towards the conflict over *P. homarus* and thus results in the unsustainability of the present usage and regulation of this marine resource.

2.1 The sustainable development framework

The concept of sustainable development began to emerge in the early 1980s with the realization that environment and development were not mutually exclusive These ideas developed as a response to the environmental debates of the early 1970's and to the growing dissatisfaction with western growth-oriented society and the impacts that it had on the world's poor and on the environment.

The Brundtland Report (1987) suggests that the conflict between environment and development could be resolved by implementing the principle of sustainable development. Two concepts underpin the Commission's idea of sustainability. The first is the overriding priority to satisfy the basic needs of all people. The second is the rejection of the notion that there are limits to growth and that in fact the limits to development are technical, cultural and social. Thus at the heart of the Brundtland Report (1987) is the notion that equity, growth and environmental maintenance are simultaneously possible with each country achieving its full economic potential while at the same time enhancing its resource base (Kirkby, O'Keefe and Timberlake, 1995).

Early environmental debates focused on the threat of continued economic growth to the diminishing natural resource base, as it was recognized that 'a lack of respect for the environment had lost man his margin of freedom to proceed by trial and error' (Dasmann, 1975, p.19). The impetus behind sustainable development came from the biological sciences and as such, the term has proved useful in that it combines the idea of prescriptive action, with that of enduring, defendable properties like biological diversity, wise resource use and wide citizen participation. In addition the notion of sustainable development is born of intellectual as much as political necessity in that it emerges from problems generated by Modernism itself, including our faith in positivistic science (Redclift and Sage, 1994). Sustainable development has long-term planning implications in that it aims to meet the basic needs of the present generation, and to extend to the next, the opportunity to satisfy aspirations for a better life, by using resources sustainably and by passing on human and natural capital. Therefore, the notion of sustainable development seeks equitable access to resources, but implies an acceptance of consumption standards that are within the boundaries of ecological sustainability (Draper, 1994).

In terms of achieving intergenerational and intragenerational equity and meeting the needs of people and the environment, the concept of sustainable development envisions development which focuses on economic growth and which recognizes the need to conserve and manage environmental resources. The wise use of resources, the direction of investments, the direction of technological advances as well as institutional mechanisms and structures, are seen as working together to meet the human needs of today and tomorrow by not contravening the integrity of the

environment. This proposed change in human management structures is based on a wider sharing of responsibilities for the impacts of public decisions, greater public access to information, and increased citizen participation in decisions that affect the environment. The ultimate prerequisite for sustainable development is thus an effective political system which provides for appropriate forms of citizen participation in decision making at all levels (Draper, 1994).

Sustainable development may be understood as a four part concept: Futurity, environmental integrity, public participation and equity (Palmer, Cooper and van der Horst, 1996). Futurity involves the idea of passing on natural capital to the future, environmental integrity means ecological integrity through the wise management of environmental support systems, public participation means enabling people to make decisions about their own environment and equity is about social justice for the world's poor and marginalised. These four elements of the concept of sustainable development are fundamental in addressing the issue of sustainable use of the marine resource *P. homarus* at Mfazazana. As a concept, sustainable development assumes a resolution of the environment/development debate through a fulfilment of the four elements described above. Should a resource not be sustainably managed, as is the case with *P. homarus* at Mfazazana, it may be concluded that one or more of these four elements has not been realized and thus the resolution of the environment/development dynamic has not come about.

Redclift and Sage (1994) indicate the strong link between the lack of human development and the depletion of the natural environment. Human development is

considered by the World Bank in the Human Development Report (1995), as meaning the enlarging of all human choices, not just income. Human capabilities, such as improved health, knowledge and skills as well as the use people make of their acquired capabilities, for productive purposes or for leisure and active involvement in cultural, social and political affairs, form the two sides of human development (World Bank, 1995). Case studies in the Philippines, Ghana and Mexico show that despite the value a particular person or people places on a natural resource, the combined effect of unattractive policy, perceived lack of compensation for conserving that natural resource and lack of human choice, whether this be at a government or at an individual level, serves to place that natural resource at risk (Redclift and Sage, 1994). In terms of the conflict over *P. homarus* at Mfazazana, these same factors may be contributing to the unsustainable management of the resource.

A critical evaluation of sustainable development reveals the imprecision of the term. The concept assumes a balancing of environmental dictates and the needs of people which is difficult to implement. Environment and development needs are seen in opposition rather than as one and the same thing: the problem of conserving *P. homarus* is pitted against the need for people to survive. Sustainable development presumes some unanimously agreed upon set of objectives rather than a means by which to achieve these. While the concept may be politically correct and appropriate, the expression of sustainability is interpreted differently for different people. On a micro level this difference is demonstrated by a survey conducted of lawyers and biologists in Britain: over 80% of both groups agreed that sustainability required the

conservation and enhancement of resources; but, while 71% of biologists agreed that it required the conservation of genetic diversity, only 28% of lawyers agreed. Of the remaining lawyers, 62% did not know whether genetic diversity should be conserved, suggesting perhaps that either they did not understand the question or that genetic diversity conservation means different things to different people (Milton, 1993).

Further outcomes of the imprecision of sustainable development involve the debates around planning now for a future unknown, both in terms of natural and human capital, as well as concerns over how sustainability may be defined for this future and the unborn generation. Changes in technology and the role which this technology will play in sustainable development in the future all remain undetermined by the notion of sustainable development (Beckerman, 1994).

The growth of environmentalism which gave birth to notions of sustainable development emerged within the industrially developed countries which have characteristics that cannot be directly extended to developing countries. In developing countries, environmental problems are development problems. Food insecurity is often present even where food production is adequate, and population growth under highly inequitable land-tenure systems continues to exert pressure on the availability of food. In the developed northern countries the lower priority needs, such as pollution and planning controls, assume importance because higher priority needs, such as housing and food, have already been satisfied. In contrast, the southern developing countries have yet to satisfy their higher priority needs and thus

these retain their importance and constitute the battleground for environmental politics (Redclift, 1984).

Environmental action on a class basis may lead to some unexpected political alliances in less developed countries. Workers in the South have been shown to perceive environmental regulations as a threat to their employment and their access to consumer society. The consumer society, which some in the North may have tired of, represents an unattainable goal for many in the South. Without the material security which development brings, market forces in the South expose the poor to environmental decay and political impotence. In the South, economic growth is often perceived to lead to environmental preservation rather than to contravene it, a logical assumption given the history of environmental protection in the North. Much of the development literature has demonstrated that even localized development processes are intimately linked to national and international exchanges. Contemporary conflicts over the environment in developing countries are part of the same process, the imbalance between North and South articulated on a class basis over the environmental conflicts of the South (Redclift, 1984).

Thus environmental conflict in the North may not be the same as in the South as the power to resolve these conflicts is not equally distributed between and within North and South. The outcome of environmental conflicts in the South are the result to a greater extent than in the North of an imbalance of interests. Vast disparities in access to resources, both political and natural, are characteristic of the South and result in an imbalance of outcomes in favor of the powerful and to the detriment of

the poor (Redclift, 1984). Power to resolve environmental conflict is not always equally distributed between North and South. The United Nations Conference on Environment and Development in 1992, only represented governments of the South within its Global Environment Facility after the decisions had been taken about its role and organization by the North (Redclift and Sage, 1994). A similar conflict exists as a result of the positions of power and choice of the NPB and the crayfishers on the management forums at Mfazazana.

The sustainable development paradigm is the source of great debate in the South African context where the principles of sustainable development underpin emerging environmental policy. Quinlan (1993) argues that South Africa has reached a 'crossroads' in its quest for sustainable development. This 'crossroads' may be grounded in the origins of the paradigm. Sustainable development was first conceived of by the natural sciences and in the South African context, within a historically, highly authoritative state structure inherited from the apartheid state. Both these elements challenge the basic tenets as espoused by the body of ideas of sustainable development of citizen participation and a balancing of human and natural constraints within a restructured system of decision making for society with equitable access to resources (Quinlan, 1993). The debate in South Africa over the viability of sustainable development continues beyond the scope of this study.

What becomes immediately apparent, not only at the micro but the macro level of society as well, is that by no means is either the path to achieve it nor the end result of sustainable development explicitly clear. The main point of departure in this

debate is the weighting of the human and natural elements in the sustainable development equation. An equation which promotes human development is seen to be anthropocentric and one which predominantly promotes the interests of the natural environment is seen to be ecocentric. Interest groups vying to inform policy are likely to have differently weighted equations depending on the agenda they represent. This difference makes policy more difficult both to generate and to implement as long as an imbalance and polarization exists between human and natural interests. Essentially it is a question of different perceptions of the value of the environment and of development which places people in different positions to the environment/development debate. As people adopt different positions within the environment/development debate this will influence how they will use, relate to and manage resources.

2.2 Environmental perception

Environmental perception theory is important in understanding how the different stakeholders position themselves in the conflict over *P. homarus* at Mfazazana which is preventing the sustainable management of the marine resource. A definition of and the factors instrumental in forming environmental perception, are discussed along with a presentation and discussion of O'Riordan's Schema of Environmental Ideologies (1989), which sets out to explain how environmental perceptions differ across the spectrum. The importance of the framework of locality in understanding

the conflict, as well as a discussion of the importance of environmental perception in understanding marine degradation are presented.

Environmental perception may be defined as the way in which an individual conceptualizes their experience of the totality of the place in which they live and their position within that place. Lowenthal (1961) argues that the perceptions of individuals are firmly rooted in their personal worlds and occur because people choose to see certain aspects of the world and ignore others. Pocock and Hudson (1978) offer a useful model of environmental perception for understanding the complicated reflexive relationship between people and their environment. They posit that 1) accumulations of the past and stored experiences and knowledge, 2) the present situation and context, 3) the psychological and physiological make-up of the person, 4) their cultural background and 5) their current state at the time of the perception interlink and work together to influence and create environmental perception.

Goodey (1974) provides further means of understanding how environmental perception is produced by the different effects of locality on the respondents through their relative perceptions of each other in an examination of 'Us' and 'Them' environments. The 'Us' environment is the immediate environment with which the respondent is intimately or emotionally involved. These environments are often difficult for the respondent to objectively describe as these are familiar and habitual places which are complex in the subjective mind. The 'Them' environment is easier to objectify, recognize and retain in image form than the environments of 'Us'. The

'Them' environments are often well known features likely to be known outside their immediate location and therefore they are overly typified in the objective mind (Goodey, 1974). In isolating and emphasizing the stereotypical structure of the 'Them' environment and maintaining the deeply subjective 'Us' environment , the stakeholders at Mfazazana are maintaining their entrenched positions on the environment/development continuum, which is creating the conflict over the marine resource.

In order to achieve this position of remove from the subjective place, the environmental features of 'Them' require propaganda and propagandists. To be effective, the propaganda has to both emphasize the importance of certain environments, and to denigrate either by omission or by unfavorable comment, the places and or structure in question. The powerful images which the media carries cause the public to reduce the complexities of the conflict to the simplicity of the 'Them' environment and thus contribute to the entrenched positions in the conflict. Goodey (1974) goes on to makes the distinction between the perceived 'Us' environment and the recognized 'Them' environment. The recognized becomes the perceived when the far-place stereotypes are removed and thus the distinctions maintaining the 'Us' and 'Them' environments become blurred (Goodey, 1974).

Goodey's (1974) concepts of environmental perception are important to this study problem. The environment/development continuum, which is the site of conflict over the marine resource *P. homarus* at Mfazazana, is maintained not only by the respondents' perception of their relationship to the research problem, but equally by

their perception of the others' relationship to the research problem. In addition, the hierarchy of power which identifies the relative position of each in terms of the conflict over *P. homarus*, is exposed in examining which 'Them' and which 'Us' holds power. Shurmer-Smith and Hannam (1994) show that the world is a more comfortable place when the legitimized view coincides with ones's own interests and when one perceives oneself to be at the center and others at the margins, as well as when one's own notions of hierarchy, morality, order and intelligence do not have to be strenuously defended at every turn. The problem with this comfort is that only a small minority of individuals find themselves in this position and thus the majority are left beyond the reach of understanding (Shurmer-Smith and Hannam, 1994). This idea of power determining agency is important when considering the disempowerment of the crayfishers at Mfazazana whose activities are illegal as opposed to the licensed crayfishers who are afforded the luxury of legitimization.

Different cultures share their own collection of chosen sights and thus culture is instrumental in the production of environmental perception. Culture, for the purposes of this research, is a system of decisions in response to learned patterns of decision making, made by an individual when faced with the given occurrences which arise in the course of their life (Downes and Rock, 1988). The primary sites of the socialization process which lead to these learned patterns of decision making are arguably, family, the education system, the media, religion, and the state.

Shurmer-Smith and Hannam (1994) indicate the link between culture and environmental perception. By deconstructing the cultural notions of the environment

held by a given society, the environmental perceptions which impact on the natural environment of that society may be accessed. The cultural landscape is a useful idea in this regard since it implies an understanding of the relationship between culture, place and time as well as the process of transmission of these through both a personal and a cultural lens (Shurmer-Smith and Hannam, 1994; Oelofse, 1994). Shurmer-Smith and Hannam (1994) view culture as the agent, the natural area as the medium and the cultural landscape as the result of the relationship between the two (Shurmer-Smith and Hannam, 1994). Different cultures, would thus view the same space, time and structure differently. The people of Mfazazana have different cultures as a result of background and divisive structures of South African society.

Godelier (1986) views economic control as the determinant of power. As different cultures with different access to the economy may exist within the same society , he sees different cultures within a given society as having unequal access to power (Godelier, 1986). If we seek to identify the powerful culture or cultures in a society we can examine which of these have recourse to the economy and which do not. If power relations between cultures are sufficiently unbalanced, an imbalance in the economy may be reflected.

This line of reasoning is consistent with Redclift's (1984) ideas regarding the divide between North and South in terms of the relationship between the economy and the environment. Simple reasoning would say then, that if access to the economy is made more equitable, then imbalances between cultures either within or between societies may be lessened. To go a step further, an illegal market in marine

organisms may be made less attractive should the imbalances in the wider economy be lessened.

The two major streams of ideology in environmental perception as identified by O'Riordan (1989) are the ecocentric and the technocentric streams. The following table illustrates the continuum from light green to deep green or deep ecology which represents the different positions taken by the different stakeholders in response to the conflict over *P. homarus* at Mfazazana. Different positions on the continuum will depend on the stakeholder's position in society and their relationship to the marine resource which are neither rigid nor fixed as shifts in perception occur with changes in the larger society. Thus O'Riordan's categories provide a framework for understanding how stakeholders' responses to the management of the resource may be examined relative to each other.

Table 2.1
O'Riordan's (1989) Table of Ideological Streams in Environmental Perception

Ecocentrism		**Technocentrism**	
Gaianism	*Communalism*	*Accommodation*	*Intervention*
Faith in the rights of nature and of the essential need for co-evolution of human and natural ethics	Faith in the co-optive capabilities of societies to establish self-reliant communities based on renewable resource use and appropriate technologies	Faith in the adaptability of institutions and approaches to assessment and evaluation to accommodate to environmental demands	Faith in the application of science, market forces, and managerial ingenuity
Demand for redistribution of power towards a decentralised, federated economy with more emphasis on informal economic and social transactions and the pursuit of participatory justice		Belief in the retention of the status quo in the existing structure of political power, but a demand for more responsiveness and accountability in political, regulatory, planning, and educational institutions (O'Riordan, 1989).	

For O'Riordan (1989), environmentalism seeks a balance between technocentrism and ecocentrism, giving environmentalism its dynamic quality. On the far right of technocentrism is the collection of beliefs which support the unlimited capacity of people to exploit the Earth and improve public well-being through the transformation of ecosystems. Interventionists still essentially control political and economic power and those responsible for governing tend to have a deep faith in the ability of humanly devised systems, such as technology, to conquer adversity. They believe that environmental considerations are incidental to economic and social advance and believe that they can upgrade the quality of existence for all the world's people so long as the right entrepreneurial and market conditions hold (O'Riordan, 1989).

Moving left, accommodation is a comfortable position in the arena of modest reform. Visualized as being socially responsible they also wish to show themselves as sensitive to environmental concerns. As a position it survives because it has led to superficially attractive reforms in terms of science methodology and institutional change. Accommodation accounts for the environmental world view of about half of the planet's developed population (O'Riordan, 1989).

From the ecocentric position, accommodation is insufficient and thus, ecocentrics are reformist. They tend to view the nature metaphor as a symbol of a new communalism, based on federated political structures, economically self-contained communities, and much more effective collective and individual power at the level of the household. In the communalist mode, economic relationships and feelings of

belonging, sharing, caring and surviving are intimately connected. Communalism feeds on idealism and a faith in the inherent co-operative character of humankind to achieve its ends more safely and expediently through co-operation rather than conflict (O'Riordan, 1989).

Gaianists bemoan the destruction of crucial ecosystems and their capacity to stabilize. It is believed that each time we significantly alter part of some natural process of regulation or introduce some new source of energy or information that we are increasing the probability that one of these changes will weaken the stability of the entire system, by cutting down the variety of response. Human beings therefore have a choice between destroying natural systems or becoming consciously part of a democratic entity. This is achieved in participating in collectively ordained causes which contribute to the intrinsic processes of homoeostasis. The difficulty for Gaianists, is how to ensure that essential adjustments can be made in time without unnecessary human and ecological suffering (O'Riordan, 1989).

Table 2.1 is thus an illustration of the contradictions and tensions brought about by the failure to agree over cause, symptom and action in achieving sustainable development. O'Riordan (1989) envisions that sustainable development results from the achievement of ecodevelopment and basic needs replenishment in terms of overcoming the processes that make the poor environmentally vulnerable. O'Riordan's (1989) table provides a framework of different positions which is relevant to the research project in capturing the complexitiy and contradictions within

the perceptions of the respondents regarding the management of the marine resource *P. homarus* at Mfazazana.

2.3 Locality: why space matters

The framework of locality was employed to understand the context of the conflict over the marine resource and the reflexive relationship between people and the environment of which environmental perception and environmental conflict are a product. At Mfazazana, the conflict over *P. homarus* through the lack of resolution of the human/environment debate is preventing the sustainable development of that marine resource.

Locality provides the framework which integrates the biophysical, the socio-economic and the political characteristics of a given place within a particular time. It transposes these characteristics over the different levels of 'reality' of that locality, in terms of the empirical, actual and real dimensions of that reality, as understood through an examination of the stakeholders perceptions. Locality allows each of the above elements of reality to be examined in relation to each other and assesses how these interactions produce environmental perception.

A piece of practical research which strongly supports the investigation of environmental perception through the framework of locality, is Kiepiel and Quinlan's (1995, 1996) work in the former Transkei. The researchers found that marine

degradation was related to poverty as well as to the varying perception of the value of marine resources by the harvesters and the buyers. In summary the low prices and irregular exchanges were endorsed by the low-level technology used in the harvesting as well as by the nature of the tourism industry and the cultural differences in categorisation of organisms as resources. Marine organisms were considered an informal 'welfare' system available to individuals in times of need. It was thus incorrect to define the marine economy as either a subsistence or emergent market, instead the marine economy was in a spiral of decline. The poorer the household, the greater the chance that that household would categorise marine organisms as commodities and collect them for sale, which otherwise would not be regarded as a 'resource' to be sold but a given to be saved for bad times. The poorest people used the lower and most vulnerable or accessible organisms, which suggests a hierarchy of use between and within households. In addition, the more biologically complex the organism in question, the greater the chance that it would be used by wealthier people in the community or outside. The poorer the harvester was and the poorer that harvester was perceived by the buyers, the greater the chance that the marine organisms would be undervalued and exploited (Kiepiel and Quinlan, 1995, 1996).

Residents could neither sustain marine stocks for general welfare as these pressures were too great, nor could they derive any substantial commercial benefit from market exchanges. Thus Kiepiel and Quinlan (1996) used the concepts of absolute value and relative value to understand perceptions of the local populations to marine organisms. This research linked the analysis of value to an analysis of

need, where basic need is defined as the health and autonomy which an individual requires to be able to choose how to survive. The lack of environmental ethic is better explained by the cultural mechanism in circumstances of poverty, by which people seek to preserve autonomy through access to a system of welfare or marine organisms. This finding suggests that where human development is not occurring then the natural environment will be accessed as the only available 'equalizer' of development (Kiepiel and Quinlan, 1996). Thus an understanding of the socio-economic characteristics of that locality informed the researchers as to why marine resources were being harvested.

2.4 Poverty and deviance

As access to economic control may determine power, poverty becomes an important element within the locality at Mfazazana since different cultures are not accessing equally the resources of power. Poverty challenges the fulfilment of sustainable development as it threatens public participation, ecological integrity and equity as fundamental elements to achieving the sustainable management of the resource.

Shurmer-Smith and Hannam (1994) point the way to conceptualizing the link between poverty and subculture. Our understanding of poverty as a relative concept must take account of the intersection of lifestyle, gender, stigma and place (Shurmer-Smith and Hannam, 1994). One definition of poverty is the inability to exercise choice about the disposal of one's income and thus contravenes human

development as defined by the World Bank (1995). The consumption of status-rich commodities can be primarily associated with desires to identify with and participate in particular subcultures. Attempts to eliminate extreme poverty are often conceived of in terms of material need satisfaction when, like perception as opposed to fact, it is the satisfaction of desires which makes social life significant. Images of dire destitution serve to construct notions of relative affluence and lack of entitlement amongst the poor (Shurmer-Smith and Hannam, 1994). This link between poverty and subculture as regards the physical environment is consistent with the prevalence of absolute and relative poverty indicated for the Mfazazana study area in the examination of the locality.

Due to poverty, relative deprivation and the desire for material goods, people may respond in ways which lead to deviant behaviour. Whether detected or not, and despite who issues the ban and how many support it, deviance may be considered as banned or controlled behaviour which is likely to attract punishment or disapproval. Deviant acts are understood as being the result of disenfranchisement or a broken bond between society and the deviant. Attachment, commitment, involvement and belief are four basic elements which characterise a social bond. Without these four elements, the bond is thought to weaken and result in a detachment of the individual from the society who is thus free to deviate (Downes and Rock, 1988).

Where the illegal harvesting of *P. homarus* at Mfazazana may be the result of weak bonds with civil society, the deviant status of the activity itself may be defined by the

relationship between the crayfishers and the resource managers. In addition to the simple fact that the activity contravenes existing laws, deviation may be more subjectively defined by those in a position to enforce those laws. By the processes of official intervention, at every stage of which the more powerful members of society are relatively advantaged, the raw data of primary deviation are filtered, screened, and negotiated to produce a predominantly lower status of the deviant. Such bonds as they already had with conventional society are even further attenuated. Their exposure to the risks of fresh deviations is correspondingly heightened (Downes and Rock, 1988).

It must be emphasised that the violation and enforcement of rules are contingent upon place, time, and character. Law officers are not automata. There is thus a tendency to treat rules as resources rather than as binding instructions. Rule-breakers may be co-opted as allies or informants, they may be effectively ignored, or they may be pursued with great vigour. Relations may change over time: shifts in personnel, policy, or politics can introduce pressures to abandon old strategies or adopt new ones (Downes and Rock, 1988). This idea of an activity being accorded different status across time and place is particularly relevant to the current transitional nature of South African society which is examined in greater detail in the following chapter.

Symbolic interactionism examines the concept that deviance itself is defined as a product of the ideas which people have of one another. It is argued that social action cannot be a response to people as they really are and in every detail. People are

constrained to react to stereotypes, a filtered, adapted, and or limited conception of themselves, each other, and the situations in which they meet. Central to such conceptions are the names and symbols upon which definitions are built: as names change, actions change.

Symbolic interactionism allows an understanding of how the stakeholders' perceptions of each other, or the 'Us' and 'Them', fit into a hierarchy of power (Downes and Rock, 1988; Goodey, 1974). In exposing the presence and nature of the hierarchy of power amongst the stakeholders at Mfazazana, a concept of differential access to the marine resource as indicated by the respondents, will make clear the influence of the different impacts of locality on the stakeholders (Downes and Rock, 1988). As the sustainable development paradigm suggests, the sustainable management of *P. homarus* at Mfazazana may be constrained by a lack of equity between stakeholders.

Conclusion

If the research problem addresses the conflict over the sustainable management of the resource *P. homarus* at Mfazazana, then the conceptual framework should be able to provide an understanding of the conflict in achieving sustainable development. The conceptual framework accords meaning to the research findings which are then able to confirm the nature and relationship between the different stakeholders in conflict over the marine resource *P. homarus* at Mfazazana.

The sustainable development paradigm conceptualizes the end goal of the successful management of the resource while environmental perception theory enables the research problem to be understood in terms of different and competing perceptions of the same marine resource regarding how sustainable development should come about. The perception produced by the multidimensional reality of experience, event and structure at the level of the individual is rendered accessible at the group level by this conceptual framework. The framework demonstrates the process by which perceptions are formed, resulting in behavior which determines whether the marine resource will be sustainably managed or not. Conceptualizing locality as well as poverty and deviance allows the characteristics of place and their different impact on individuals relative to income and power to come to the fore. The relationship between the conceptual framework and the field work is reflexive in that theory informs practice and practice informs theory to the rigorous benefit of both. Thus a very complex interplay of factors is rendered understandable by linking theory with fieldwork.

CHAPTER 3. THE LOCALITY OF MFAZAZANA

Introduction

As the environment/development dynamic is understood from the perspective of people's perception, it is necessary to examine the elements which influence the different perceptions evident amongst the various stakeholders. The interaction of these elements, the biophysical, the socio-economic and the political as they function over time combine to form the specifics of the particular locality. The following section examines these different elements in terms of understanding the perceptual differences of the various stakeholders who impact on *P. homarus* as a marine resource at Mfazazana.

Locality, or place, is a theoretical construct defined as the context within which the structures of society and the action of individuals and groups, or agency, are played out. The locality has a reflexive relationship with structure and agency in the sense that these shape the interpretation of place and space by individuals and groups operating under given structures in a given locality at a certain time. Therefore, 'within any locality, the nature of society and space is dependent on the structures of society, the interpretation of human agents of the causal powers and the contingent conditions present' (Oelofse, 1994, p.19). For the purposes of this study, the locality of Mfazazana will be examined in terms of the relationship between the biophysical, the political and the socio-economic dimensions as these exist temporally.

3.1 The biophysical environment

An examination of the biophysical elements is accomplished by examining the biophysical and geographical description and boundaries of Mfazazana as these relate to the marine resource, the available biological and sociological data regarding *P. homarus* and the legislative and regulatory structure which impact on the marine resource at Mfazazana.

Description of the study area

The KZN south coast extends from Durban in the north to Port Edward in the south (approximately 160 km). The KZN south coast comprises a relatively unbroken system of urban development and holiday resorts accessed from the N2 highway. The administrative area of the former KwaZulu abuts the Indian Ocean at two points along this stretch, at Umgababa near Umkomaas, and in the area of Mfazazana near Hibberdene (See Figure 3.1).

The Mfazazana study area for this research is defined by the same boundaries as those for the research conducted by the INR and published in 1992. The Mfazazana study area is thus defined as the stretch of coastline extending from the Mnamfu river to the south of the village of Mtwalume for approximately five kilometres to the Mhlungwa river mouth lying to the immediate north of Hibberdene (See Figure 3.2). Inland the area includes a residential community roughly bounded by the old R 102

south coast road. Within the study boundaries, crayfish stocks are exploited by residents in rocky inshore waters located between the Mnamfu and KwaMakosi rivers in the north (the Turton catchment area) and between the Mfazazana and Mhlungwa rivers in the south (the Mfazazana catchment area) (INR, 1992).

The coastal margin has variable climate, soils and vegetation which change abruptly from place to place and thus environmental diversity is high as opposed to patterns experienced in the interior. The coastal margins of the east of South Africa experience warmer and more humid conditions than the interior plateau (Fuggle and Rabie, 1983). The KZN coastal strip experiences some of the highest rainfall totals in the country often exceeding 1 000 mm per annum (Fuggle and Rabie, 1983; Cedara, 1995).

Therefore, the biophysical nature of the terrestrial section of the study area, in terms of high diversity over short distances, suggests that human patterns of settlement in the coastal margins may significantly impact on the natural environment to an equal if not greater degree than in the interior (Fuggle and Rabie, 1983). The fragile nature of human-terrestrial environment interactions in the coastal margin is significant for two reasons. The first being in terms of the corresponding pressure on the marine environment where human livelihood may not be gained in agriculture. The second point of significance is the role which this fragile interaction plays in highlighting the importance of environment/development research in the coastal margin due to the sensitive nature of the environment.

Access to marine resources at Mfazazana is generally both relatively safe, in terms of the natural environment at least, and rewarding. The physical conditions, as already indicated, are favourable to both an abundant marine life as well as easy access to people from the beach. Despite the illegality of commercially exploiting this resource, the ready market makes this resource very attractive at a commercial level

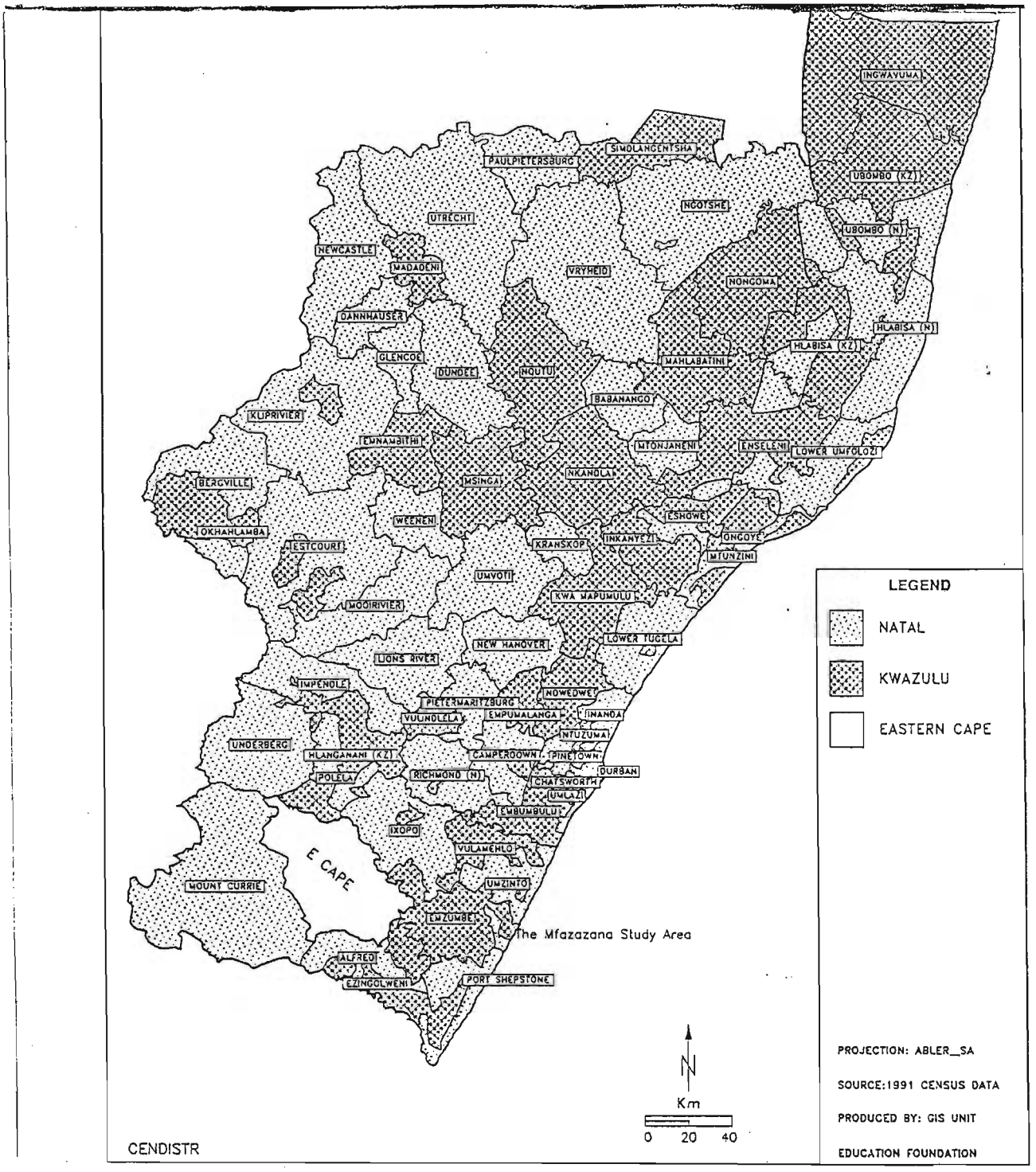

FIGURE 3.1 CENSUS DISTRICTS OF KWAZULU-NATAL SHOWING FORMER KWAZULU BOUNDARIES

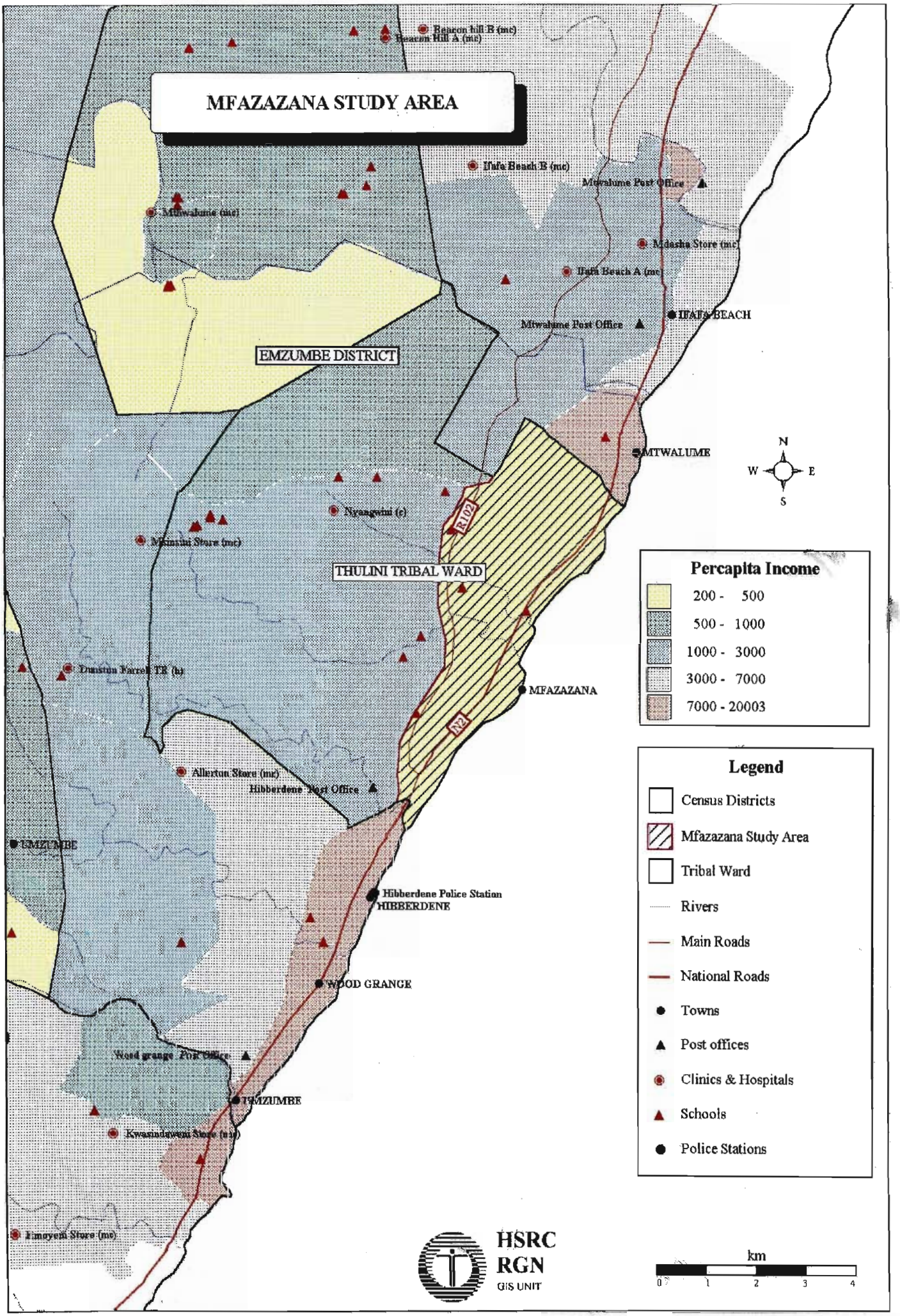

FIGURE 3.2 MAP AND TABULAR DATA OF THE MFAZAZANA STUDY AREA 1997

The biology and human use of P. homarus

Two main studies will be reviewed in this section, Schleyers's unpublished work with the ORI at Mfazazana completed in June 1991 and the Institute of Natural Resources (INR) study at Mfazazana published in October 1992. It should be noted that the INR study (1992) is in fact a compilation of the sociological study completed by the INR and the biological study completed by the ORI. Where information is provided by the original studies before having been compiled and where this information has not been included in the combined INR study (1992), it will be presented according to the original author.

Distribution, behavior and sexual reproduction of P. homarus

The available biological information will be presented in terms of distribution, behaviour, reproduction and sexual development, as well as an examination of the size and structure of the *P. homarus* population with a final discussion of the rock lobster fishery in South Africa.

P. homarus is fairly widely distributed along the east coast of South Africa between Port Elizabeth in the south and Barra Falsa in the North. The species lives predominantly on rocky shore reefs in an optimal depth range of 1-5 m where the favoured diet of *P. homarus*, the brown mussel (*P. perna*), is found. *P. homarus* is not normally found at depths greater than 10 m (Schleyer, 1991; Fielding, 1995).

P. homarus tends to be a nocturnal species in that they occupy shallow crevices during the day with antennae extended towards the open water. They use these antennae to detect invasion of their lairs by potential predators in the frequent conditions of poor visibility in which they live, where the rocky shore reefs regularly silt up. When a lair is invaded, the animal swiftly retreats to the deepest crevices in which they wedge themselves, thus making capture difficult. At night they emerge from their caves to feed opportunistically on whatever may be available which generally means *P. perna* and barnacles. They move to more amenable reefs when their lairs become overcrowded or filled with sediment (Schleyer, 1991; Fielding, 1995).

P. homarus eggs hatch into phyllosoma larvae which go through nine developmental stages, each with its particular set of needs in terms of diet and physical environment (Schleyer, 1991; Fielding, pers comm). The last phyllosomal stage metamorphoses into a single puerulus stage, after which the animals settle as small crayfish six months after hatching. Sexual maturity is reached at about 55 mm in carapace length, usually in September or October. Therefore at the legal size limit of 65 mm in carapace length, a male will be approximately 4.3 years and the female 3.6 years after settlement (Schleyer, 1991). Reproduction takes place mainly during the summer months in closed season. Females are most fecund as they enter their sixth year after settlement and these larger animals breed up to four times throughout the year. Thus at the 70-79 mm carapace length size class, the reproduction of animals of this size is greater than larger or smaller animals relative to their body mass (Schleyer, 1991).

The ORI study (1991) provides evidence that the size and structure of the crayfish population in the Mfazazana study area differs significantly from that of a control area at Pumula, which tends to be frequented by sports fishers not resident at Mfazazana. It showed that inshore breeding stocks at Mfazazana could not withstand the current fishing pressure as the population was being reduced through the removal of undersized animals. However, there were still questions relating to the recruitment of inshore populations as crayfish were only slightly more abundant on the offshore reefs at Mfazazana, where human access is significantly more difficult than on the inshore reefs. This raises the question of the feasibility of opening the rock lobster fishery to commercial use, as the extent to which this fishery could rely on offshore recruitment is unknown. Therefore, this case study shows that there is sufficient justification to proceed with a more comprehensive monitoring programme on the state of the rock lobster fishery (INR, 1992).

Fielding's study (1995) of the state of the *P. homarus* fishery, reveals that the rock lobster fishery on the KZN coast is 'probably not overexploited at present and increased fishing efforts by divers catching +65 mm animals would need to be exerted before egg production was reduced to dangerously low levels' (Fielding, 1995, p.14). However, the illegal removal of undersized animals could lead to recruitment failure at much reduced levels of fishing effort. 'Surplus production modelling using Fisheries Licensing Board data on catch and Catch per Unit Effort indicates that the rock crayfish resource on the KwaZulu-Natal coast is currently not over-exploited' (Fielding, 1995, p.14). Catch Per Unit effort is the number of animals captured in a given period of time.

Therefore as the regulations are applied and respected at present, *P. homarus* is not in imminent ecological danger. However, studies at Mfazazana and in the former Transkei support the premise that enforcement of the law is the pivotal factor in the biological fitness of this animal. Persistent violation of those regulations which pertain to undersized animals and females in berry (in reproductive season) as well as closed season limits, will threaten the reproductive potential of *P. homarus* and thus reduce population numbers to the detriment of the animal's biological fitness (Fielding and Robertson et al, 1994; Fielding, 1995). Population numbers are calculated to be biologically unfit when these reach 50% of pristine stock levels (Fielding, pers comm).

The use of P. homarus

This section presents the capture methods, fishing behaviour, catch rates, both actual and perceived, trading activities and an examination of the value of the marine resource *P. homarus* to the community as well as to the harvesters. A discussion of law enforcement at Mfazazana is included in addition to an overview of the link between the socio-economic perceptions of users and the degradation of marine organisms in the former Transkei and in the Western Cape province will be presented in terms of informing this study.

It is important to note that this research differentiates between two types of illegal harvester of *P. homarus* at Mfazazana. There is the syndicate harvester who with the

use of sophisticated technology, illegally captures vast quantities of *P. homarus* for sale to a market outside the immediate area of Mfazazana. Then there is the artisanal harvester who is resident at Mfazazana and illegally captures *P. homarus* there, using either poling or diving. Artisanal technology is generally restricted to a face mask, as opposed to syndicate divers who may dive at Mfazazana and elsewhere and who make use of SCUBA equipment, fridges and power boats (Millar, 13/09/96). The difference between these two fishers is vast in terms of the impacts on *P. homarus*. The syndicate harvester accesses both the inshore and offshore reefs which provide the replenishing stock to the inshore reefs. The artisanal fisher with a face mask is not able to access the offshore reefs. A study of these syndicate harvesters was beyond the scope of this study.

Two main methods of capture are employed by illegal resident harvesters at Mfazazana. Poling and diving are both legal capture techniques in terms of the coastal fishing regulations as long as the harvester has a licence and does not sell his catch. The use of baited lines also requires that a mussel licence be obtained by the fisher (INR, 1992). The most common method is the baited line in which *P. perna* is used as fresh bait after being stripped from the intertidal rocks at low tide. These are opened to expose the flesh and the shells drilled and then strung on a wire or nylon thread. This is attached to a rod or pole and fished in rocky inshore areas inhabited by crayfish (INR, 1992).

Fishing with the pole method is carried out at night when the crayfish are mobile and actively feeding on mussel. Poling is generally restricted to periods of low spring tide

when fishers are able to gain access to exposed intertidal rocks. Calm sea conditions are also required for effective fishing as lines need to be suspended directly above the crayfish as casting techniques cannot be employed. Crayfish attach themselves to the baited lines and are caught when the line is first gradually raised and then jerked swiftly from the water. Since the crayfish is not damaged by this fishing method they can be inspected for legality in terms of size and sexual condition and then returned to the water if required (INR, 1992).

The second main method of capture is by free diving which is generally carried out during the day. Crayfish are captured as the diver feels along ledges and rock crevices. The need to be touch sensitive to the presence of crayfish, means that these divers do not wear gloves or protection for their feet and thus often carry the marks of rock and crayfish lacerations. This method is physically demanding and is normally carried out by young men and boys in KwaZulu-Natal (Millar, pers comm; INR, 1992), though middle-aged women have been known to free dive for *P. homarus* in the former Transkei (Beatie, 24/09/96).

Diving is generally restricted to low water and calm surf conditions. It is perceived to be a dangerous activity carried out by those prepared to take the risk of rock lacerations, eel bites and drowning. The INR study (1992) indicates that sport diving for *P. homarus* is a foreign concept to the average Mfazazana fisher, and that it is the prospect of making a substantial income from the sale of the animal which motivates these divers. Despite the dangers involved, the INR study (1992) indicated that catch rates can be good and that an experienced diver in favourable weather

conditions can take his legal bag limit of eight crayfish in a few hours. Divers take *P. homarus* non-selectively and sorting is done on the beach (INR, 1992).

Fishing, whatever the method, appears to be conducted in small groups to evade law enforcement agents and for mutual support. Fishers indicated that they preferred to fish in the Mfazazana study area because of the increased chance of apprehension by the law outside the study area (INR, 1992). This perception that Mfazazana is less subject to law enforcement than other rocky shore areas may be a contributing factor to the presence of syndicate harvesting as well as artisanal harvesting in the study area.

Quantitative catch rates were not determined by the INR study (1992), though NPB estimates of total whole weight of *P. homarus* landed along the KZN coast between 1990 and 1994 are variable (INR, 1992; NPB, 1993-1994, 1994-1995). An increase in 1993 of the estimates of total weight of *P. homarus* is explained by an increase in the number of licences issued from that year (NPB, 1993-1994, 1994-1995). Between 80 and 100 tons of *P. homarus* are being taken off the north coast of KwaZulu-Natal and at least the same is speculated to be taken of the southern KZN coast (Fielding, pers comm). Catch rates are important if Catch Per Unit Effort is to be determined in monitoring *P. homarus* populations.

When fishers were asked whether fishing was better or worse now than when they had started, most indicated that fishing had deteriorated. The reason given was that many more people were now involved in the capture and sale of *P. homarus* due to

the high unemployment rate in the region. Essentially then, the crayfishers did not point to declining stocks due to overfishing but rather felt that the same stable, stocks were being divided between many more people (INR, 1992).

Though one seller may act on behalf of several harvesters, it was found that fishers often operated as individuals securing the best price they could through direct sale. Sellers appeared to work in pairs positioning themselves strategically along the N2, so as to watch for law enforcement vehicles as well as potential customers. The favoured vehicle appeared to be a non-local registration plate as these often indicated tourists who would be prepared to pay the highest prices (INR, 1992).

Trading activities as examined by the INR study (1992), indicated that trading and marketing were two distinct activities not necessarily undertaken by the same person. The preferred method of sale is to a regular buyer, generally White[1] or Indian, with the most popular trading outlet being along the N2 highway at Mfazazana. Other less used outlets, are the beach cottages, local hotels and resorts (INR, 1992). It is significant that Mfazazana remains the only area along the KZN south coast where both illegal harvesting and selling of *P. homarus* occurs together. Previous research suggests that this may be due to differently applied protection measures in former KwaZulu areas (INR, 1992). However the absence of selling at Umgababa appears to refute this hypothesis (Broker, 01/10/96).

[1] The terms Black, White and Indian are employed for one of two reasons. When the stakeholders themselves have used these terms they have been reflected in the text. In addition, the researcher uses these terms as a means of denoting the social constructs still operating as a result of apartheid legislation. To disregard these constructs would be to disregard factors which affect a South African individual's perception of their world.

The INR study (1992) was not able to determine the value that *P. homarus* holds for their illegal harvesters nor the value that it holds for the community, but the following is speculated. Despite detailed marketing descriptions, none of the nine fishers interviewed in the INR study (1992) admitted to marketing crayfish. Crayfish does not appear to be a favoured source of food to the community and thus the study speculates that 'significant personal income' is motivating the continued illegal capture and sale of *P. homarus* at Mfazazana. *P. homarus* is generally sold in bunches of four or five to motorists for between R4 and R8 each with bunches selling for between R25 and R50 (1991 prices). NPB evidence suggests that roughly 100 individuals are involved in the illegal harvest and sale of *P. homarus*, though no confirmation of this estimate has ever been made (INR, 1992).

If the INR (1992) estimate of there being 757 households with an average of 7.5 people per household in 1992 is correct, then the illegal crayfish harvesting community at Mfazazana constitutes 1.8% of the total community. If the INR (1992) study is correct in stating that the money derived from the capture and sale of *P. homarus* is personal income then the direct benefit of *P. homarus* as a marine resource to the community is less than marginal. However if the NPB are correct in their pricing, a crayfisher who catches his eight crayfish a day and sells them all at a cost of R10 each every day would earn R2400 a month. Despite the fact that the figures used are estimates and that economic and weather conditions do not allow for this level of return, even half that revenue is a 'significant ' income given the lack of other economic prospects available to a resident at Mfazazana.

Law enforcement is the main source of contact between the community and the resource managers. It is not surprising then that conflict between these two groups has arisen with accusations being made from both sides. The resource managers, including the SAP and the NPB, alleged that at the time of the INR study (1992), crayfish were kept in latrines in order to keep them alive until they were sold, a story that was broadcast on the national news of the day. This 'latrine story' was vehemently denied by those interviewed in the INR study (1992) (INR, 1992; Colvin, pers comm). In addition, serious incidents of stone throwing and ambushing of law enforcement vehicles took place prior to the crack down operation on the part of the SAP and NPB in November 1995 (de Beer, 12/09/96; Millar, pers comm). At the same time accusations of threats and assaults, as well as differential application of the law, were being levelled by the community at the resource managers (INR, 1992; Colvin, pers comm; de Beer, 12/09/96; Millar, pers comm).

The INR study (1992) revealed that both the community and the resource managers perceived the law to be ineffective. The nature of the existing legislation demands that a sales transaction be observed and both the buyer and the seller be apprehended for a successful conviction, which makes prosecution particularly difficult. On the other hand, the community complained that non-residents with sophisticated equipment were involved in the illegal use of the marine resource *P. homarus* but that few of these persons were ever caught while members of the local community were frequently the subject of conviction (INR, 1992). This last point made by the community appears to represent a call for consistency in the application of the law.

The number of prosecutions at the time of the INR study (1992) was also the subject of discussion by the authors. Mfazazana forms a significant part of what is termed zone 16 by the NPB. Between 1986 and 1990 an average of 19% of all prosecutions made for illegal crayfish capture and sale offences were made in zone 16 which accounts for only 6% of the KZN coastline available to *P. homarus* (INR, 1992). This figure remains fairly constant from 1993 to 1995. This ratio of area to number of offences is high and suggests either a high degree of violation at Mfazazana or a high degree of control relative to other areas.

It is the relationship between human and crayfish populations which defines *P. homarus* as a marine resource. A study by van Sittert (1992) of the history of the West Coast rock lobster, *Jasus lalandii (J. lalandii)*, highlights the hostility of the marine environment to capitalism. Except in petty and merchant forms, its common property status, its susceptibility to the 'vagaries of weather and resource', and its super abundance, led crayfish to be relegated to the status of 'poor man's food' by the colonial population until the turn the century. In contrast, the pre-colonial populations living along the western coastal fringe of Southern Africa had always considered *J.lalandii* an important source of food. With the advent of the First World War, 'poor man's food' became highly prized by Paris' business class and thus the South African crayfishery came into being as supplies of the North American varieties succumbed to the pressures of the post-War period. By 1920 overfishing of *J.lalandii* at the Cape, due to inappropriate and commercially driven legislation, was evident (van Sittert, 1992).

Research by Kiepiel and Quinlan (1995, 1996) in the former Transkei indicates the danger to marine resources when they are undervalued by their users. In their analysis, the researchers found that there was no conservation ethic on the part of the respondents, due to the perception of abundance, intermittent use and inconsistent recognition that marine organisms were a resource. In addition, the practices of state conservation agencies showed that conservation had not been a serious item on their agenda. The analysis of relative value, indicated that the practices of state, commercial enterprises and tourists who undervalued the resource themselves when participating in exchange, had inadvertently created an economy which undervalued marine resources and thus contributed to the depletion of those resources (Kiepiel and Quinlan, 1996).

Today the exorbitant prices for *J.lalandii* in response to its scarcity and the degradation of marine resources in the Transkei lay testimony to marine resources in danger. The demand which fuels the capture and sale of *P. homarus* is the same which motivates the demand for *J.lalandii*, the luxurising of a marine resource which was once considered inedible by the moneyed elite in South Africa. This process of luxurising appears to drive the price of the resource up to the point where trade becomes increasingly promising, difficult to control and subject to illicit activity which places the resource at risk of depletion.

By the same token, the inherent dangers demonstrated by Kiepiel and Quinlan (1995) in the social undervaluation of a marine resource also contribute to the depletion of *P. homarus*. Where the price for a resource is driven down in response

to a socio-economic environment which promotes a false sense of abundance to the point where controls are loosened, the resource is also at risk of exploitation. Demonstrated above are the dangers to a resource if left to the whims of a market economy which luxurises and undervalues commodities based on human perceptions of abundance and scarcity.

Where *P. homarus* may not be in imminent ecological danger, the above overview indicates the threat posed to the species by virtue of its intersection with patterns of use as a marine resource. The violation of the law on the part of crayfishers at Mfazazana, the lack of information regarding catch rates, the perception of constant stock levels on the part of the crayfishers, the negative perception by these same crayfishers of law enforcement, and the ineffectiveness of existing regulations and regulatory systems regardless of the efficacy of the laws which motivated them, all constitute a threat to *P. homarus* at Mfazazana. In addition the biological fitness of *P. homarus* is threatened by a potential increase in the level of fishing technology, the luxury status of the marine resource itself, as well as the undervaluation of marine organisms. The division of labour in terms of the capture and sale of the resource, which allows for a potential increase in both and the relatively low value of *P. homarus* to the community at Mfazazana may also threaten the species.

Legislation and regulation of P. homarus

The legislative structure governing the environment is currently in a state of transition. Existing environmental legislation at both the provincial and national level is still operational. However the process of policy framework development is currently progressing at both levels. A Green Paper on national environmental policy has been released to encourage public response and debate. It is anticipated that a White Paper will be released towards the middle of 1997. The White Paper will indicate government's commitments with regard to environmental policy. Once a national environmental policy is adopted by Parliament, it is anticipated that an audit of all laws relevant to environmental matters will be undertaken. This audit will identify areas that require review, consolidation, amendment or new legislation (Butler, pers comm).

With specific reference to the southern KZN coast, the following initiatives are currently underway. There is a process examining the issue of the 'Admiralty Reserve' along the coast which could identify ways of using the 'Admiralty Reserve' to further the aims of environmental conservation and equitable access to the coast (Butler, pers comm). The Coastal Zone Management Advisory Programme (CMAP) is an initiative of the Minister of Environmental Affairs and Tourism which aims to educate coastal populations in the Cape Provinces and KZN in coastal zone management (Department of Environment Affairs, 1995). A greater awareness of environmental issues regarding the coastal zone on the part of Transitional Local Councils (TLCs) in the southern KZN region was initiated in November 1996 by the

KDNC in collaboration with CMAP to a great extent. The NPB continues to work with conservancies along the southern KZN coastal strip to establish working models of sustainable use. They have also set up the South Coast Fishing Forum at the Minister of Environmental Affairs and Tourism's request, in order to generate proposals for coastal zone policy.

Currently, the use of *P. homarus* is governed by the National Sea Fisheries Act No.12 of 1988 and the Natal Ordinance No. 15 of 1974 and the following regulations are currently in place. *P. homarus* is a non-commercial species at present and permits are issued either for its capture as a non-commercial species or as bait. The method of capture is limited to a baited hook, an approved trap or by hand. The bag limits are per licence category; a maximum of three *P. homarus* may be taken for bait a day and eight a day may be captured with the non-commercial crayfish licence. There is a minimum size limit of 65 mm for the carapace length and no female crayfish may be taken in berry. No offal of *P. homarus* may be returned to sea and undersize animals and females in berry must be returned alive. Finally the duration of the harvesting season for *P. homarus* is limited by the closed season from 1 November to the last day of February (Province of Natal, 1974).

It should be noted that the concurrent administration of national and provincial regulations is not always smooth. Where the Natal Ordinance No. 15 of 1974 regulates *P. homarus* differently than the National Sea Fisheries Act No.12 of 1988, the Natal Ordinance has precedence within the provincial boundaries. The National Sea Fisheries Act No. 12 of 1988, defines the closed season as being from 1

November to 31 January and the carapace length is legal size at 57 mm. In addition, no bag limit governs *P. homarus* in national regulations (Republic of South Africa, 1992).

To make matters even more confusing, *P. homarus* is governed differently across different provinces, reflecting the distribution patterns of this species. The Eastern Cape, which still operates under the former Transkei Sea Fisheries Act No. 58 of 1973, does not work on a permit system. One may only be in possession of five crayfish at any one time except in terms of the hotel permit, which specifies that *P. homarus* may only be used for human consumption and must be consumed on the premises of the hotel or restaurant to which the permit was issued (Republic of Transkei, 1991).

The environmental legislative structure as this relates to *P. homarus* is currently in a state of transition. All previous legislation stands however until the process of policy framework development is complete. This environmental policy, handed down by previous governments as it pertains to *P. homarus*, is inconsistent across the provinces where the marine resource occurs and is incongruent between national and provincial capacities, making the sustainable management of this resource even more difficult.

3.2 The socio-economic environment

An overview of the socio-economic elements that constitute the locality under examination will be achieved by looking at a range of socio-demographic and economic indicators. An examination of the present and projected socio-economic status of a given region is likely to indicate possible areas of ecological concern. If people are socio-economically disadvantaged this will cause a greater level of dependency on the natural environment and thus place that environment at risk.

The demographic information for this study comes from three secondary sources. The first is the report by Urban-Econ published in 1996 which was supplied by the Department of Welfare and Population Development. The second source is the demographic information provided by the INR study of Mfazazana published in 1992. The third is the information supplied by the Human Sciences Research Council (HSRC) and includes relatively recent demographic information which has been compiled on an ongoing basis. Though a national census was conducted during the course of this study, the results were not available for inclusion in this document.

Population size, distribution and structure

Demographic information for the Mfazazana region will be accessed through information available for the magisterial district of Umzumbe, as well as through information pertaining to the enumerator area, a sub-section of the magisterial

district. This demographic information may be extrapolated in some cases in order to identify potential population characteristics in the future and corresponding development implications for the region. In order to contextualize some of the information presented, figures for former Natal will be given alongside those for the former KwaZulu in the tables below. The following tables are a presentation of population trends pertaining to the Mfazazana study area.

The magisterial districts of Alfred, Port Shepstone and Umzinto form part of former Natal and the magisterial districts of Umzumbe, Ezingolweni and Vulamehlo form part of former KwaZulu. The Mfazazana study area is in the district of Umzumbe, under the Thulini Tribal Authority and is serviced by the Southern Natal Joint Services Board (See Figure 3.2). The Mfazazana area now forms part of a Regional Council which is currently being established. The map of the Mfazazana study area, shown in Figure 3.2, identifies the district as Emzumbe, however consultation with local people revealed that the district was known as Umzumbe. Thus this study identifies the district of the study area as the district of Umzumbe.

- The current population size of southern KZN[2] is around 744 000 (Urban-Econ, 1996).
- The projected population growth rate is expected to increase marginally into the 21st century as it has between 1980 and 1991 (It presently sits at 1.24%) (Urban-Econ, 1996).

[2] Southern KZN is defined as the area comprising Ugu Region Seven of KwaZulu-Natal which is roughly bounded by the Umkomaas river in the north, the Umtamvuna river in the south and inland to Harding (Urban-Econ Spokesperson, 02/04/97).

The projected aggregate growth rate for this section of the province is relatively low. However, it is expected to differ across urban and rural settlements. Two general trends may be discerned by examining the population figure from 1991 to 2013 as displayed in Table 3.1.

Table 3.1 POPULATION PROJECTIONS 1991-2013

District	1991	2003	2013
Alfred	8794	10782	13011
Port Shepstone	67239	79869	93716
Umzinto	46919	60079	72141
Umzumbe	**2317399**	**268029**	**319119**
Ezingolweni	215224	267428	320761
Vulamehlo	125179	134227	136590
Total Average	680755	840519	1002499

Urban-Econ: June 1996

The Umzumbe district is expected to have the second highest population in the region by the year 2013 where as it had the highest population in the region in 1991. The large population to be found in this rural area will feel the lack of services and economic opportunities (Urban-Econ, 1996). Despite the anticipated slowing down of population growth due to the projected migration of people out of the rural areas, these needs will remain (Urban-Econ, 1996).

Umzumbe forms part of former KwaZulu where population densities are high as a result of the historical process of settlement in those and other homeland areas under successive apartheid administrations. These former reserve and later

homeland areas are underdeveloped and lack resources, facilities and economic opportunities. The stark contrast between urban and rural settlement in former Natal and former KwaZulu are illustrated in Table 3.2 below.

Table 3.2 PERCENTAGE POPULATION CONCENTRATION IN URBAN AND RURAL ENVIRONMENTS

MAGISTERIAL DISTRICT	LOCALITY (%)	
	Urban	Rural
Alfred	41.2	58.8
Port Shepstone	71.3	28.7
Umzinto	61.3	38.7
Umzumbe	**0.0**	**100.0**
Ezingolweni	5.2	94.8
Vulamehlo	0.0	100.0
Total Average	13.5	86.5

Urban-Econ: June 1996

Table 3.3 indicates the large predominance of females over males in the economically active category (50.2% compared with 39.2%) in the Umzumbe district. This sex composition by district is evidence of a process of male migration from the overwhelmingly non-urban former KwaZulu districts, to the largely urban former Natal districts. It may be concluded then that where there is a high degree of male migration from an area there will a correspondingly high degree of female-headed households. Thus where a district is 100% rural (See Table 3.2), such as is the case of Umzumbe, it is expected that the households in that district will be overwhelmingly female-headed. It is predominantly low income households who use marine

resources and poor women who predominantly harvest *P. perna* (Kiepiel and Quinlan, 1995, 1996), the favoured food of *P. homarus*.

Table 3.3 PERCENTAGE POPULATION COMPOSITION BY MAGISTERIAL DISTRICT 1991

DISTRICT	AGE						TOTAL	
	0-14		15-65		65+			
	Male	Female	Male	Female	Male	Female	Male	Female
Alfred	24.1	30.0	73.1	66.1	2.8	3.8	56.0	44.0
Port Shepstone	20.5	20.9	69.4	66.5	10.2	12.6	52.0	48.0
Umzinto	23.5	26.8	69.4	64.4	7.1	8.8	52.0	47.0
Umzumbe	**56.8**	**44.1**	**39.2**	**50.2**	**4.0**	**5.6**	**44.2**	**55.8**
Ezingolweni	53.3	43.2	43.3	52.1	3.4	4.7	44.7	55.3
Vulamehlo	57.0	43.3	39.4	51.4	3.6	5.3	44.2	55.8
Average % (Sex)	48.5	40.4	46.8	53.5	4.6	6.1	45.9	54.1
Average % (Age)	44.2		50.4		5.4		100.0	

Urban-Econ: June 1996

Socio-economic profile of Mfazazana

The high unemployment rate (55.6%) and low participation rate (31.3%) indicate the low levels of participation and potential to participate in the formal economy (See Table 3.4). This is compounded by a large number of people (23.6%) who are illiterate and thereby constrained from seeking employment other than in the manual and unskilled labour force (See Table 3.4). This leads to the low projected employment rates (14.7%) for 2013 (See Table 3.5) as is evident in the population structure where women are in the majority (See Table 3.3). The male absenteeism

rate for Umzumbe of -45.8% (See Table 3.4) underlines the preponderance of female-headed households.

The burden of poverty thus falls disproportionately on women who have to support households with large numbers of dependents. The dependency rate of 6.2% (See Table 3.4) for Umzumbe is projected to increase to 12.5% by 2013 (See Table 3.5) indicating a deepening of poverty in the future in rural areas such as Umzumbe where employment opportunities are low. This absolute poverty is indicated by the average monthly household income of R526. 40 (See Appendix 2). Such income is supplemented to a degree by subsistence agriculture with 28.7% of household's operating a one hectare plot and 47% a garden plot (See Appendix 2).

This low percentage of the households engaged in agriculture and animal husbandry is surprising in such a rural area (See Appendix 2). Informal activities only contribute relatively small amounts of income to supplement formal wages, remittances and pensions which account for the major source of income to the residents of Umzumbe. For example informal retail activity, eg. hawking, only constitutes 4.5% of income in the Umzumbe district (See Appendix 2).

Table 3.4 SUMMARY OF SOCIO-ECONOMIC INDICATORS 1990

DISTRICT	Participation Rate(%)	Dependency Ratio	Unemployment Rate(%)	Male Absenteeism Rate (%)	Illiteracy Rate (%)
Alfred	73.5	1.4	8.0	0.9	31.3
Port Shepstone	76.3	1.0	3.9	15.3	25.8
Umzinto	67.3	1.3	9.2	18.2	29.9
Former Natal	72.4	1.2	7.0	11.5	29.0
Umzumbe	**31.3**	**6.2**	**55.6**	**-45.8**	**23.6**
Ezingolweni	36.3	5.2	19.1	-40.0	25.8
Vulamehlo	26.6	7.4	29.5	-46.2	26.7
Former KwaZulu	31.4	6.3	34.7	-44.0	25.4
Southern KZN	5.9	3.8	20.9	-16.3	26.4
KZN	53.6	2.3	25.2	-14.5	18.9

Urban-Econ: June 1996

* The participation rate is the percentage of people actually available to the labour market.

The projected unemployment rate for the Umzumbe area for 2013 is 85.3% and is indicative of the extremely marginal economic opportunities in the region in the coming decades (See Table 3.5). This is likely to fuel greater dependency on marine resources than presently experienced in the region and becomes particularly clear when relative deprivation is considered. The projected Umzumbe employment rate of 14.7% and a dependency ratio of 12.5 when compared with the projected Port Shepstone employment rate of 96.3% and a dependency ratio of 1.9 (See Table 3.5) indicated the relative deprivation experienced in Umzumbe. Inevitably poor economic opportunities and the increased dependency ratios (See Table 3.5) do not bode well for *P. homarus* as a marine resource at Mfazazana.

Table 3.5 PROJECTED REGIONAL EMPLOYMENT AND DEPENDENCY RATES

2013

DISTRICT	Total Population	Labour Force	Employment Opportunities	Employment Rate (%)	Dependency Ratio
Alfred	13011	10970	3710	33.8	3.5
Port Shepstone	93716	57808	55657	96.3	1.9
Umzinto	72141	49631	28244	56.9	2.6
Umzumbe	**319119**	**173795**	**25558**	**14.7**	**12.5**
Ezingolweni	320761	170178	45792	26.9	7.0
Vulamehlo	136590	65976	14087	21.4	9.7
SKZN	1002499	528359	173047	32.8	5.8

Urban-Econ: June 1996

Appendix 2 shows the low level of average household income in the Umzumbe district and when compared to the other former KwaZulu districts in the region, the relatively high proportion of income spent on food (52.7%) and energy sources other than electricity (16.9%), are further indications of the impoverishment of the community living at Mfazazana. In addition, despite the greater prevalence of agricultural activity at Mfazazana, as compared with the other former KwaZulu districts in the region, income derived from agricultural production is the lowest in the region. This low level of reliance on agriculture, where marine resources are readily accessible, and where the average household income is low in absolute and relative terms, is a further indication of the potential threat to *P. homarus* at Mfazazana. In addition to the above evidence of the socio-economic environment at Mfazazana, the access to marine resources and the benefits from agriculture, industry, and tourism enables further understanding of the dependence by residents

at Mfazazana on *P. homarus*. Though marine resources do not feature in Appendix 2, the INR study in 1992 makes reference to the fact that Mfazazana falls within an area where local households purportedly depend on the fishery in some way or another as part of their livelihood.

The regional context and implications for development

Within a provincial and national context, southern KZN may be noted for a low population growth rate and low illiteracy rate. However while the level of unemployment within southern KZN is lower than the national rate it is significantly higher than that for the province. In addition the degree to which the formal sector has the capacity to absorb the potential labour force compares poorly in relation to both the province and the country. The spatial distribution of the population corresponds with the distribution of economic activity, with clustering around the main economic centres. Therefore, the urban populations are expected to show an increase in the coming years with the rural populations showing a decrease (Urban-Econ, 1996). There are marked inequalities across the former Natal and KwaZulu districts of the southern KZN region in terms of wealth, service and infrastructure provision as well as population distribution (See Figure 3.2 and Tables 3.1-3.5). The capacity to pay for installation and or improvement in services and infrastructure is different for former Natal than for former KwaZulu and this difference must be considered in the planning process (Urban-Econ, 1996). Augmenting capacity in the

rural areas will go a long way in securing stable development in those areas and one way to achieve this in part is to provide basic services (Urban-Econ, 1996).

Ninety-one percent of households in the Umzumbe district live below the minimum living level of R15000 per annum (HSRC, 1991). None of the population within this same district have on-site water facilities and neither have they water borne sanitation (HSRC, 1991). As indicated by Figure 3.2, access to facilities at Mfazazana is poor and this coupled with the relatively low income levels starkly illustrated on the map (See Figure 3.2), demonstrate the case for relative and absolute deprivation. This provides a strong motivating factor in the continued illegal harvest and sale of *P. homarus* at Mfazazana. The apartheid state has systematically produced a level of absolute and relative deprivation in its homeland areas. Discussion of the above socio-economic factors indicate that residents at Mfazazana are experiencing absolute deprivation and poverty as self-sufficient survival is constrained by irregular and insufficient income and a lack of medical and educational facilities (See Figure 3.2 and Tables 3.1-3.5). In addition the residents at Mfazazana are relatively deprived within former KwaZulu and former Natal districts. Relative deprivation occurs where differently deprived groups are able to compare themselves based on the perceived affluence of the other group generally due to the physical proximity of one group to the other. The group in a relatively lower socio-economic position will attempt to 'equalize' positions and thus attain the perceived affluence of the other. Figure 3.2 illustrates the Mfazazana area in yellow as the lowest income earners in the region with no post office, clinic or police station, while flanked by the highest income earners in red with greater access to these facilities

(See Figure 3.2). The absolute and relative deprivation experienced by the population at Mfazazana is a strong motivating factor in the illegal capture and sale of *P. homarus* there. An examination of the socio-economic status of the community at Mfazazana clearly indicates that if *P. homarus* is not at risk ecologically it is most certainly at risk due to the socio-economic environment which exists in that locality.

The present and projected size and structure as well as the participation rate, dependency ratio, unemployment and male absentee rate, degree of illiteracy and occupation patterns of the population at Mfazazana indicate an impoverished community which is suffering from both relative and absolute deprivation. In addition present access to services and facilities in terms of health, education and crime control as well as economic opportunities at Mfazazana is low (See Figure 3.2). These factors understandably place great pressure on marine reources such as *P. homarus.*

An examination of the access to marine resources, agriculture, industry and tourism, as available to the people who live at Mfazazana, enables further understanding of the socio-economic conditions present in the study area. Though marine resources do not feature in Appendix 2, the INR study in 1992 made reference to the fact that Mfazazana falls within an area where local households purportedly depend on the fishery in some way or another as part of their livelihood.

Security constraints are an obstacle in harvesting marine resources at Mfazazana. Physical security was noted by several individuals involved in this study as being a

problem and the researcher was warned not to come to the beach alone nor to leave sight of a vehicle for any length of time. Another constraint was the fear of being caught with an illegal harvest. On several occasions the research team experienced problems accessing appropriate respondents due to suspicion on the part of these respondents that the SAP was involved.

In their study of the area, Perkins and May (1987) indicate that comparatively few male residents were engaged in agricultural activities on their own land (1.4%) (INR, 1992) as is supported by Table 2.7 (Urban-Econ, 1996). This suggests that agriculture has a relatively low priority in the economic life of rural households in Umzumbe. Farming appears to be perceived as a marginal part-time activity to provide some irregular contribution to household food requirements rather than as a means of regular cash income generation (INR, 1992).

As indicated by the Perkins and May (1987) study, the majority of households have access to arable land (INR, 1992). However the sample indicated that the holdings in the Umzumbe district were small; 76% of the sample had arable plots of less than 2 hectares and the mean plot size was 1.37 hectares of arable land (INR, 1992). It is anticipated that the high population density in the coastal zone would cause those arable plots in Mfazazana to be even smaller. Most households in the Umzumbe district engage in some form of subsistence activity and most households (75%) cultivate all their land; maize appears to be the favourite crop (INR, 1992).

The Mfazazana region is recommended soil for bananas and sugar cane and to a lesser extent, maize, kikuyu grass for beef cattle, as well as gum and tomatoes (Cedara 1995). At present the study area is successfully cultivated with sugar cane (INR 1992). It was mentioned by Pope (pers comm) that macadamia nuts may be another possible crop, though the Perkins and May (1987) study did indicate that the land holdings are generally too small for successful cash cropping (INR, 1992).

Industry does not exist in any substantial way in the immediate vicinity of the study area. The closest major centre is Durban which is approximately one-and-a-half hours away by taxi and a return trip costs about R35 (Tsawulwayo, pers comm). This journey is not economical in time and money for most people unless justified by an exceptional salary in Durban.

The next port of call then, after agriculture and industry have been exhausted, is tourism. Tourism is Janus faced on the KZN south coast. It provides a great number of job opportunities and the potential for ongoing development in an area which has traditionally been economically depressed. Tourism thus provides a cash injection into the region as well as skills training particularly in the building industry (Fox, 1996). However concern has been expressed regarding the environmental impacts of the tourism industry on the natural environment (Fox, 1996).

The releasing of the tension between economic profit and natural preservation may be found in ecotourism (Fox, 1996; Roberts, 01/10/96). The Department of Economic Affairs and Tourism, a provincial capacity, is currently investigating ways in which

Mfazazana and other communities could undertake and benefit from an ecotourism venture (KDNC meeting, pers comm.) The necessary expertise exists in the form of the Tourism Development Officer of the KDNC based at Southport to explore this possibility further. It should be noted that insufficient time and staff may be the greatest obstacles to exploring ecotourism options, rather than due to lack of interest or skill.

Relative socio-economic context

Within a provincial and national context southern KZN may be noted for a low population growth rate and low illiteracy rate. However while the level of unemployment within southern KZN is lower than the national rate it is significantly higher than that for the province. In addition the degree to which the formal sector has the capacity to absorb the potential labour force compares poorly in relation to both the province and the country. The spatial distribution of the population corresponds with the distribution of economic activity, with clustering around the main economic centres. Therefore, the urban populations are expected to show an increase in the coming years with the rural populations showing a decrease (Urban-Econ, 1996).

Development implications

There are marked inequalities across the former Natal and KwaZulu districts of the southern KZN region in terms of wealth, service and infrastructure provision as well as population distribution. The capacity to pay for installation and or improvement in services and infrastructure is different for former Natal than for former KwaZulu and this difference must be considered in the planning process. Rural-urban migration trends may be expected to coincide with increased demand for land upon which to settle both formally as well as informally, as well as for formal employment opportunities (Urban-Econ, 1996). Augmenting capacity in the rural areas will go along way in securing stable development in those areas and one way to achieve this in part is to provide basic services (Urban-Econ, 1996).

The issue of physical security is one that pervades beyond the risks associated with the harvesting and sale of marine resources at Mfazazana. A heterogeneous community resulting from heavy in-migration during periods of unrest in the second half of the 1980s and the early 1990s, was identified by SAP respondents as producing an Mfazazana which had few internal controls (de Beer, 12/09/96). Reasons for this heavy in-migration to Mfazazana was the perception on the part of the immigrants that it was a stable and spacious community relative to the places left behind (Mtaka, 09/10/96).

The present and projected size, distribution, structure, participation rate, dependency ratio, unemployment rate, male absenteeism, degree of illiteracy and

occupation patterns of the population at Mfazazana are all clearly indicative of an impoverished community in terms of absolute deprivation. In addition present access to services and facilities in terms of health, education and crime control as well as economic opportunities at Mfazazana is marginal.

The Apartheid state is known to have systematically produced absolute and relative deprivation in its homeland areas. Where there is clear indication of an absolute level of deprivation as demonstrated by the above indicators, relative deprivation in terms of the difference in the results of these indicators across former KwaZulu and former Natal districts, are also strongly indicated by all the secondary sources employed. Figure 3.2 indicates clearly the level of relative deprivation experienced by the population at Mfazazana which is a strong motivating factor in the illegal capture and sale of *P. homarus* there. An examination of the socio-economy at Mfazazana clearly indicates that if *P. homarus* is not at risk ecologically it is most certainly at risk socio-economically

3.3 The political environment

An examination of the political environment which finds expression in the locality of Mfazazana is presented here by examining the historical context of the locality and the transition of government and parastatal agencies since these powers impact on the marine resource *P. homarus* at Mfazazana. The political structures and relations which operate at a societal level provide a framework within which conflicts are

resolved and it is these power relations that provide opportunities or constraints for people living in the area.

Historical context

The historical context of the Mfazazana area is related by Rassenyalo (pers comm) who is currently completing a book on the subject. In pre-1964 South Africa, the area in and around Mfazazana was a White residential area and fishing spot named Turton in what was then a largely Black KwaZulu Location 4. Under the dictates of apartheid legislation in 1964, the former White area was reclassified to Black KwaZulu and the South African Native Trust set about buying land from private White owners and thus annexing it as Location 3. The area thus came under the control of the Bantu Administration of KwaZulu with Chief B. Luthuli acting as leader of the Thulini Tribal Authority, whose son is leader today.

KwaZulu became a homeland in 1964 whereupon a separate set of structures and agencies came into existence for the administration of this territory which included Umzumbe, Vulamehlo and Ezingolweni (See Figure 3.1). These operated as parallel structures to agencies in former Natal which had jurisdiction over the neighbouring districts of Port Shepstone, Alfred and Umzinto (See Figure 3.1). Since 1994, government structures have entered a transitional phase as the amalgamation of duplicate agencies across the former territories commences.

Agency in transition

In order to understand the transition period and how it impacts on *P. homarus*, an examination of the structure and responsibilities of the various governing agencies currently acting in the Mfazazana region will be undertaken. These agencies are the NPB, the KDNC, the SAP, the Community Development Forum, the Community Policing Forum and the South Coast Fishing Forum.

The NPB and the KDNC await imminent amalgamation in terms of the unification of powers of former Natal and former KwaZulu under one province[3]. Until the amalgamation is through, the division of powers as dictated by the former Apartheid governments stands. The illegal capture and sale of *P. homarus* at Mfazazana therefore comes under the joint though split responsibility of the KDNC, the conservation arm of the former KwaZulu government, and the NPB, the conservation arm of the former Natal government. KwaZulu is responsible for activities from the high water mark up to the N2 and Natal is responsible for activities from the high water mark down to the national water mark and on the N2.

This already complex system of governance is further complicated by a differential application of the law across the two former territories. The KDNC had two objectives when it was formed in 1982; to increase the amount of protected land in former

[3] See NPB. Sea Fisheries Act 12/1988 and Natal Nature Conservation Ordinance 15/1974 Amalgamation: Discussion Documents and Draft One of Proposed Regulations. *NPB*. 29 August 1995.

KwaZulu and to develop a conservation strategy for KwaZulu (Davion, 1995). The KDNC was never specifically charged with the implementation of either the provincial nor the national law within its boundaries. In contrast the NPB fulfilled its mission statement, 'that of assisting all other public and private groups in ensuring the wise use of the biosphere' through its Neighbour Relations Policy which was launched in 1992 (Davion, 1995, p.20) and through its task of implementing the law, as this pertains to conservation in Natal. KDNC authority in KwaZulu is thus hampered by the ineffective political will which the apartheid government saw fit to tender to a weakly autonomous KwaZulu. Autonomous enough not to be the responsibility of the apartheid state, but not enough to merit the power to administer its own system of law enforcement.

The task of law enforcement in the former KwaZulu is thus difficult in light of the fact that the law enforcement agency, the NPB, has no jurisdiction 'outside' former Natal and the agency which does have jurisdiction at Mfazazana is not tasked with law enforcement. With particular reference to the case at Mfazazana, *P. homarus* which is illegally captured in the water, is the responsibility of the NPB, but where the animal is landed within KwaZulu it becomes the responsibility of the KDNC which has no law enforcement capacity. Animals caught in the water are difficult to administer as they may be thrown back and thus possession is difficult to establish. Therefore *P. homarus* which is illegally captured in former KwaZulu, has the dubious distinction of not being under any effective system of law.

As the capture and sale of *P. homarus* is an illegal activity, the SAP have a stake in this issue on three counts. The first is the illegal nature of the activity itself, at which point the NPB are often called in to verify that it is in fact *P. homarus* which is involved where the NPB have explicit jurisdiction. This identification is beyond the scope of the SAP. The second area of concern to the SAP is the traffic congestion which results from the illegal stopping of motorists to buy crayfish on the side of the road. The third issue, which is of grave concern to all parties involved and the particular responsibility of the community and the SAP, is the danger inherent in the sale of any commodity along a very busy highway. At least three crayfish sellers have died in collisions with passing motorists in the last few years (Millar, pers comm). In the case of the traffic problem and the homicides, the SAP is clearly the authority responsible. However in the case of the illegal capture and sale of *P. homarus*, once again the authority is blurred as both the SAP and the NPB may charge an offender but only the NPB is able to effectively find offence.

The Community Development Forum at Mfazazana and the Community Policing Forum were both established under the mandate of the Government of National Unity in January 1995 (Rassenyalo, pers comm). The Community Development Forum at Mfazazana is made up of residents of Mfazazana and aims to identify and promote development objectives in the community. The Community Policing Forum is made up of members of the Mfazazana community, members of the Hibberdene community, the SAP, the NPB, and other interested and affected parties. As an organisation it aims to deal with issues relating to crime through a participative process to the advantage of the communities involved. As both forums are only

newly established under a transitional government system, the benefits of their formation remain to be seen. It should be noted however that a combined law enforcement effort to crack down on illegal crayfish sellers along the N2 on the part of the two forums, the SAP and the NPB in November 1995, appears to have brought down the number of sellers and the violent quality of encounters between authorities and the offenders involved (Community Policing Forum Meeting, pers comm).

The South Coast Fishing Forum was set up when the NPB was tasked with establishing where the needs and concerns of affected resource users lay with a view to generating policy (Millar, pers comm). This task was set out by the Fisheries Policy Development Committee which reports to the Minister of Environmental Affairs and Tourism. This Committee is tasked with generating fisheries policy which is appropriate and reflects the aims of the new political dispensation[4].

A further indication of the transitional nature of authority structures impinging on *P. homarus* is the condition of agricultural extension services in the area. The former Natal and KwaZulu Departments of Agriculture amalgamated two years ago however the areas under their respective control still remain largely so for the time being (Pope, pers comm). It will take time for the newly unified organisation to bring their combined knowledge to bear on stimulating agricultural activities in the rural sector, which includes Mfazazana.

[4] See Republic of South Africa (1996) and van der Elst(1996).

Thus the political environment of the locality of Mfazazana is in a process of change. Present authority structures are in a process of transition and unification. This shift will address the ineffectiveness of the unequal divide of conservation authority in former Natal and former KwaZulu. As illustrated above, *P. homarus* at Mfazazana, as it is governed under existing law and prior to the enactment of new legislation is effectively not controlled by any conservation authority in the province.

Conclusion

As indicated by the above examination of the locality of Mfazazana in terms of the biophysical, socio-economic and political factors which interact currently and which impinge on the marine resource at Mfazazana, *P. homarus* is indeed at risk. The nature of this risk comes from the particular current interaction of these factors rather than from any inherent biological property of the species itself. Therefore it is the intersection of the patterns of use, the existing legislation and socio-economic context which threatens the biological fitness of *P. homarus* as a marine resource at Mfazazana.

As demonstrated, the biophysical, socio-economic and political factors intersect to produce the particular locality within which the biological fitness of *P. homarus* at Mfazazana is threatened. The characteristics of the locality as described in this chapter play an important role in shaping and forming peoples' perceptions of the resource and hence how they behave towards it. This study aims to address the

issue of sustainable resource use through an examination of the perceptions of the various stakeholders who impact on *P. homarus* at Mfazazana. In terms of the conflict, it is proposed that the perception of the respondents, which are outcomes of the processes described above, places them in a particular position on the environment/development continuum. It is the particular position of a respondent on that continuum which places that respondent in conflict with other stakeholders regarding the management of the marine resource. This conflict prevents effective management of that resource within the dictates of sustainable use.

CHAPTER 4. RESEARCH DESIGN AND METHODOLOGY

Introduction

In terms of the dictates of this study, the research design and methodology needed to be able to accommodate the diverse perceptions of the stakeholders regarding the sustainable management of the marine resource *P. homarus* at Mfazazana. At the same time it needed to maintain a single conceptual framework of analysis in order to accord meaning to the data. The role of the research design and methodology is to expose the perceptions of the stakeholders regarding *P. homarus* at Mfazazana, and in so doing expose the different relationships between the people and the marine resource *P. homarus*. The following section will examine other methodologies relevant to this study including the precedent for a challenge to Positivism. From here a review of the research design of this study, including a description of the controls and the method employed, will be presented and finally a critique of the research design and method will conclude this chapter.

4.1 Review of other studies on marine conservation

The following research reflects the need for more participatory approaches in understanding the conflict over marine resources. Kiepiel and Quinlan (1995,1996) and Quinlan's (1996) work in the former Transkei demonstrate the challenges of interdisciplinary research. Harris (1996) at Mapelane demonstrates a method of participative research in achieving equitable and sustainable resource use. Colvin's (1992) study at Mfazazana acts as a methodological forerunner to this study and thus gives this study the benefit of its experience.

Kiepiel and Quinlan's research in the former Transkei

As discussed in the literature review, Kiepiel and Quinlan's (1995, 1996; Quinlan, 1996) study for the ORI in the Transkei involved a socio-economic examination of the role that tourism could play in coastal ecology. The biophysical component of the study was completed by the ORI. The researchers employed a case study approach and field research was conducted for 13 days during early January 1995 in the Umngazi-Mpande locality. It was assumed that this locality was representative of the Wild Coast, given the presence of a hotel, holiday cottages and camp site.

In terms of the broader methodology involved in environment and development work, Kiepiel and Quinlan|s (1995, 1996; Quinlan, 1996) studies indicate the challenge brought about by the interdisciplinary nature of this emerging science to

conventional specialist fields. The ecosystem analysis required an interaction of both biophysical and social scientists. Time and budget constraints however, meant that the social and biophysical components were completed independently, and the programme design necessitated a practical approach where a theoretical explanation was needed. To put it simply, marine degradation became a function of poverty which missed the 'totality' of the conditions in the study area. This totality demanded an understanding of the reason for the subjects' particular actions and perceptions of their relationship to the sea, rather than the definition of the solution in terms of a socio-economic enquiry from the start. Thus the potential for interdiscplinarity is undermined by dominant structures, such as positivist frameworks, which need to change with the changing focus in this field.

Harris's research at Mapelane

Work on the north coast of KZN by Harris for the NPB (1996), on the viability of community managed mussel bed programmes, may take us closer to real examples of successful sustainable use of marine resources. Available evidence suggests that the method in which mussels are collected dramatically influences the rate of recovery of that affected mussel bed. Thus, there appears to be a potential for developing strategies to maximize yields, while preventing long-term damage to the rocky shore structure through community management of the resource.

Four methods were employed to gather as well as to disseminate information over the reporting period of a year: biological surveys, community meetings, interviews and workshops. The first six months of the project were taken up with a survey of the mussel stocks. Results of this survey led to the identification of a zone for exclusive use by the subsistence gatherers. Two community meetings were held about six months apart, in order to allow the Mussel Committee to inform the mussel gatherers of the decisions it was taking on their behalf and to provide the opportunity for questions to be asked. House-to-house interviews were conducted, the results of which were entered into a database in order to understand the history of harvesting and the needs of the mussel collectors when making recommendations for the resource. The workshop was held in January 1996 to facilitate the sharing of information and was attended by the mussel collectors involved in the study.

What Harris (1996) has done is to grasp at once the value of community participation and basic biological science in achieving fundamental changes in resource use. The results of this experiment are to be revealed over the course of the next four or five years and could pave the way for new interdisciplinary methodology.

Colvin's research at Mfazazana

Colvin's work for the INR (1992) at Mfazazana was essentially a scoping exercise aimed at eliciting the opinion, attitudes and perceptions of local people about the

harvesting and scale of *P. homarus*. Two reconnaissance visits to hear the perspectives of the NPB in the area provided the means for initial introductions to the community through the Thulini Tribal Authority. Two paid informants were identified by the local authorities to observe and report on the methods and incidence of night fishing through undercover visits to the beach. The ethics of this covert operation were abandoned and a more direct approach to accessing the crayfishers through accepted channels was employed despite the increased time requirements of this approach.

Thus interviews with the crayfishers, following approval of the survey by the *Chief Induna* [5], were conducted over a three day period which produced a total of nine interviews. A follow up meeting attended by twelve people followed the interview process roughly six months after the initial reconnaissance meetings. A workshop six months later, which included members of the community and members of the relevant authorities, was set up to review the findings of the research programme and to provide input and direction to the information needs and action steps to be taken in managing the resource.

Colvin (1992) identifies the problems of being an outsider, limited time available, as well as the illegal nature of the activity itself as major obstacles to achieving adequate results. As a scoping exercise, Colvin's (1992) research provides valuable methodological insights for this study.

[5] The Chief Induna is the principal adviser to the head or Chief of a Tribal Authority

Precedent for a challenge to positivism

The above studies signal a challenge to positivism which is the framework often adopted by researchers in the field of environment and development. Cock's (1994) call to sociology to challenge positivistic approaches is justified in terms of sociology's failure to acknowledge the threat of environmental degradation and to establish the relevance of this degradation to the changing social climate in South Africa. Reasons for this include the organisational resistance to the social sciences which is amplified by many social scientists' own lack of clear sense of professional identity and competence. This identity crisis is highlighted in multi disciplinary settings, prevalent in the field of environment and development science, where, as identified by Cock (1994), teams do not have the luxury of common theory and methodology.

This organisational resistance to the social sciences is often grounded in the positivistic belief that all reliable knowledge can be measured and that therefore the social and cultural impacts of development are largely immeasurable. The danger of this stance to the non-human environment, becomes even more evident when we consider that social science has been homocentric, in that it has dealt with humans as the exclusive universe (Cock, 1994). To go a step further, where the natural sciences have seen fit to disregard the human environment as immeasurable, Cock (1994) posits that the social sciences have been equally ignorant in their myopia which blinkers them to base their livelihoods on claims of human uniqueness and

fears of questioning the taboo which says social fact may not be explained by nonsocial factors (Cock, 1994).

Essentially then, Cock (1994) argues for the dangers of disciplinary division in environment and development science. Division in the sense of divided disciplines and thus divided theory and methodology, but also in the sense of divided purpose. An undoing of these divisions would create a framework within which sociologists in South Africa could engage in environmental debates and address the problems of environmental deterioration, the lack of adequate policy for environmental protection and environmental illiteracy (Cock, 1994).The South African reality needs to be addressed by a 'new environmentalism'. A more holistic understanding is emerging in which environmental issues are anchored in wider debates around sustainable development. The focus is shifting from 'conservation' in the narrow sense of the preservation of threatened plants, animals and wilderness areas to address the needs of local communities and to suggest ways in which they can participate in environmental decision making and benefit from tourism (Cock, 1994).

Shurmer-Smith and Hannam (1994), in their call for a post-structuralist philosophy, confirm the need to understand the concept of becoming rather than being. Essentially they reflect what seems negotiable and contingent, and refract those previous ideas which were developed to explain supposedly static conditions. These static conditions failed to discern the relationships, values and behaviors which steadfastly refuse to remain within established boundaries and are thus in the positivistic sense immeasurable.

In line with a move away from positivistic principles of enquiry, the role of deconstruction (Shurmer-Smith and Hannam, 1994) allows for the discovery of a further breadth of perceptual expression while being contained within a meaningful methodological framework. Deconstruction is a systematic naivete which involves the act of asking what, instead of how. In terms of the enquiry process deconstruction allows for an examination of the respondent's system of values regarding the research problem through the act of assuming nothing at all. This method of enquiry was practiced on a constant basis in an attempt on the part of the researcher to deconstruct dominant assumptions in the perceptions presented by the respondents in relation to the theoretical framework.

4.2 Research design

In order to elicit the perceptions of the stakeholders regarding the illegal harvesting of the marine resource *P. homarus* at Mfazazana, the following methodology and research design was employed. The course chosen was one which would elicit qualitative information through a loosely structured questionnaire format (See Appendix 3) which could be applied to all respondents regardless of their position in relation to the marine resource and yet still allow for different perspectives to be revealed.

The stakeholders were identified during the course of the first five weeks of the initial contact and research phase of the project. A stakeholder was identified when that individual or group demonstrated a regular and or systematic responsibility and or

relationship to the marine resource *P. homarus* at Mfazazana. The method employed by the researcher in this process was to contact those stakeholders identified by the KDNC, establish their status as a stakeholder and then to enquire whether these stakeholders were aware of any others. The list of stakeholders was considered complete when no new stakeholders were identified.

Seven stakeholder groups, which were non-randomly selected, were accessed in total for this study. The resource managers which included the NPB, the KDNC, the Community Development Forum at Mfazazana, the Community Policing Forum, the Hibberdene Tourism and Publicity Association, the South Coast Fishing Forum and the crayfishers make up the seven groups. The interests of the SAP and the Thulini Tribal Authority were accessed through the Community Policing Forum, the Community Development Forum at Mfazazana, the Hibberdene Tourism and Publicity Association and the South Coast Fishing Forum on which sit members of the SAP and the Thulini Tribal Authority.

Primary data collection of a demographic nature was beyond the scope of this study due to time and budget constraints, as well as being methodologically unfeasible. The illegal nature of the activity under scrutiny here, necessitated a non-random selection method of respondents from Mfazazana beach in addition to networking. The majority of interviews took place at Mfazazana beach, and the others were conducted on roads and in cafes and residences where potential respondents were identified. Random sampling was precluded by the lack of a detailed list of the illegal crayfishing community at Mfazazana. It should be noted however that a minimum of demographic information was

collected during the course of this study which provided the basis for analysis without jeopardizing the trust and thus the quality of interaction between the interviewer and the respondents.

The questionnaire employed for this study was open-ended and qualitative in nature and consisted of five basic areas of enquiry (See Appendix 3). All the interviews were conducted in a face-to-face manner. The probes listed for each question, as presented in Appendix 3, were used to prompt the respondent when necessary. If the respondent provided the information needed spontaneously, then the probe was not used. The questionnaire was translated into Zulu by the research assistant before commencing field work. Respondents were given a choice of being interviewed in either Zulu or English as well as whether to remain anonymous or not. All interviews were taped with the full knowledge of the respondents and the contents of these tapes were thereafter transcribed into written text.

All crayfishers were interviewed between 9:00 in the morning and 2:00 in the afternoon from Monday to Friday, as suggested by the guide, over a six week period. Respondents from the other stakeholder groups were interviewed at various times, seven days a week over the same six week period.

Description of controls

Three broad areas of investigation, as identified in the theory, were accessed by the research questions: levels of human development as outlined by put Redclift and Sage (1994), Shurmer-Smith and Hannam (1994), World Bank (1995) and Kiepiel and Quinlan (1995, 1996); stakeholder perceptions of relative and absolute power in the conflict over the resource *P. homarus* at Mfazazana as outlined by Goodey (1974), Redclift (1984), Godelier (1986), Downes and Rock, (1988), Shurmer-Smith and Hannam (1994) and Kiepiel and Quinlan (1995, 1996); and the absolute and relative perceptions of the stakeholders on the continuum of environmental perception as outlined by O'Riordan (1989).

The first area of enquiry, 'Your role, responsibility and relationship to *P. homarus*', aimed at testing for Kiepiel and Quinlan's (1996) concepts of absolute and relative value. The subjective perception of 'Us' and 'Them' and the relative power between stakeholders was tested here (Goodey, 1974; Redclift, 1984; Godelier, 1986; Downes and Rock, 1988; Shurmer-Smith and Hannam, 1994; Kiepiel and Quinlan, 1995, 1996). Relative levels of human development among respondents (Redclift and Sage, 1994; Shurmer-Smith and Hannam, 1994; World Bank, 1995; Kiepiel and Quinlan, 1995, 1996) were also investigated. Stakeholder perceptions of environmental resources as discussed by O'Riordan (1989) as well as the conditions of the locality were also revealed

The second area of enquiry, 'Your perception of the role, responsibility and relationship of the others to *P. homarus*', aimed at testing for Kiepiel and Quinlan's (1996) concepts of absolute and relative value. The subjective concept and quality of 'Them' and the differential notions of 'Us' and 'Them' in terms of access to power (Goodey, 1974; Redclift, 1984; Godelier, 1986; Downes and Rock, 1988; Shurmer-Smith and Hannam, 1994; Kiepiel and Quinlan, 1995, 1996) as well as the relative notions of human development among respondents (Redclift and Sage, 1994; Shurmer-Smith and Hannam, 1994; World Bank, 1995; Kiepiel and Quinlan, 1995, 1996) were tested here. The revealing of dominant stereotypes, in the perceptions of the respondents of the other, aimed at establishing how respondents formed, accessed and promoted stereotypes in terms of revealing the hierarchy of power relations between stakeholders (Goodey, 1974; Godelier, 1986; Downes and Rock, 1988). The conditions of the locality were also revealed by this area of enquiry.

The third area of enquiry, ' Your perception of regulation regarding *P. homarus*', aimed at further testing for the dominant stereotypes in the perceptions of the respondents of the other stakeholders in terms of confirming the relations of power between the stakeholders (Goodey, 1974; Godelier, 1986; Downes and Rock, 1988). In addition, the degree and type of 'ownership' of the resource in terms of value and power (Goodey, 1974; Redclift, 1984; Godelier, 1986; Downes and Rock, 1988; Shurmer-Smith and Hannam, 1994; Kiepiel and Quinlan, 1995, 1996) was investigated along with the level of understanding and support for the regulations as they stand. It was anticipated that the level of familiarity with the regulatory system might indicate the respondent's position to the structures of regulatory power. The stakeholders' perceptions of

regulation revealed their relationship to regulation and thus the degree of drift or deviance from norms.

The fourth area of enquiry, 'What should be done regarding *P. homarus*', tested for the positive or negative perception of the future of the marine resource as conceived of by the respondent in terms of the sustainable management of the resource . It aimed at testing for the respondent's position on the O'Riordan (1989) scale of environmental perception and thus tested for people's positions in relation to how they value resources in the environment. This area of enquiry also aimed at testing for the issue of power in terms of relative levels of human development (Goodey, 1974; Redclift, 1984; Godelier, 1986; Downes and Rock, 1988; Redclift and Sage, 1994; Shurmer-Smith and Hannam, 1994; World Bank, 1995; Kiepiel and Quinlan, 1995,1996). In addition, the stakeholders' socio-economic positions as these are tied to the characteristics of the locality were revealed.

And finally the fifth area of enquiry, 'Has your relationship to *P. homarus* changed over time', tested for the reason for quality of change regarding the research problem as experienced by the respondent. This measure of change would also be used to determine the level of power and control (Goodey, 1974; Redclift, 1984; Godelier, 1986; Downes and Rock, 1988; Shurmer-Smith and Hannam, 1994; Kiepiel and Quinlan, 1995, 1996) as experienced by the respondent regarding the marine resource. It was anticipated that the area of focus of concern as regards this change would also be revealed and thus further indicate the respondent's position on the O'Riordan (1989)

environmental perception continuum. In addition, the stakeholders' socio-economic positions as these are tied to the characteristics of the locality were revealed.

Description of method

Permission for the study was granted by the Thulini Tribal Authority under the authority of Chief Luthuli through the assistance of Mr. James Rassenyalo, a member of the Thulini Tribal Authority and avid environmentalist, who had been referred to the researcher by the KDNC. As the researcher does not speak Zulu and as the community's identification of a guide and interpreter was not forthcoming in time for the start of the field work, the researcher appointed Mrs. Gugu Tsawulwayo to act as research assistant and interpreter. Tsawulwayo is not a resident of Mfazazana but lives relatively close by and inland at Bethania. Mr. Strydom Mbili was employed as a guide following Tsawulwayo's interview with the first group of crayfishers. Mbili is a resident of Mfazazana and well versed in the ways of the crayfishers there.

Through Rassenyalo, the deceased Chief Induna's son, Mr. Norman Cele, was contacted so as to arrange for meetings with both the identified community authorities for interviews but also with the crayfishers. The deceased Chief Induna had participated actively in the INR study (1992). As a result of the meeting with Cele, interviews with members of the Community Policing Forum and the Community Development Forum were conducted. This process of contact with the relevant parties was conducted over the period of five weeks prior to commencing the field work.

A total of 18 crayfishers were interviewed by Tsawulwayo in Zulu at Mfazazana over the course of six weeks in September and October 1996. It was following the interview with the first crayfisher that it was decided, on the advice of Tsawulwayo, that while the researcher should be available, a better quality of interview would result if the questions were translated into Zulu and that she conduct the interviews on her own with minimum input from the researcher. Interviews ranged from 30 minutes to one hour and all interviews were taped and translated by Tsawulwayo afterwards. Respondents were generally interviewed in the groups they were encountered in as they came off the beach. All 18 crayfishers chose to remain anonymous.

A total of 15 interviews were conducted with members of the six resource management stakeholder groups as identified by this study in terms of their impact on *P. homarus*. These individuals were generally accessed by telephone, though three residents of Mfazazana were contacted through Rassenyalo and one through the local shop. Three of the individuals were interviewed by Tsawulwayo in Zulu and the other twelve were interviewed by the researcher in English. Three members of the KDNC, three members of the NPB, two members of the South Coast Fishing Forum, two members of the Hibberdene Tourism and Publicity Association, two members of the Community Policing Forum, two members of the Mfazazana Community Development Forum and one interested and affected party were interviewed over a six week period in September and October 1996. All save one of these 15 respondents chose to be named in the study.

All respondents were told that the research was being conducted by the researcher who was a Master's student at the University of Natal, Pietermaritzurg (UNP) at the time of

the study. If more information was requested then it was communicated that the KDNC had initiated an examination of the research problem.

Critique of research design and method

There is no doubt that three factors were overwhelmingly responsible for the successful completion of the field work. These factors were, the deliberately distant position to the study which the primary funding agency, the KDNC, adopted throughout the study; the fact that a similar study had been completed only four years before (INR,1992), and the 'onsite' position of the researcher during the entire duration of the field work and write up.

The position of distance as adopted by the KDNC allowed for an independent methodology to be developed for the study and thus assured a lack of bias. The KDNC's own lack of involvement with the community in terms of a law enforcement capacity has accorded the agency an 'ahistorical' status, free from associations in the minds of the Mfazazana residents with past governments and past law enforcement initiatives and thus free from the immediate conflict over the marine resource *P. homarus*. This lack of direction allows for a 'pristine' access to the community should the KDNC so choose to involve itself in environmental education at Mfazazana in the future.

The conducting of the INR study (1992) within recent memory of the community at Mfazazana allowed for the following: permission for this study was easily and quickly accorded by the Thulini Tribal Authority, through the person of Rassenyalo; access to the relevant individuals was easily achieved through the approval of the Thulini Tribal Authority for the study and quickly achieved through the information provided by the INR study (1992). The greatest proof of the successful entry into the community as gained by Colvin (1992) was the trusting and helpful response of the Mfazazana community during the course of this study.

The 'onsite' position of the researcher allowed for the following pivotal factors in the successful collection of data. The researcher was travelling daily to Mfazazana from Margate which is a round trip of about 140 km. The first factor was a ready access to the individuals involved by virtue of the close distance, which allowed for the context of the problem at Mfazazana to be more fully explored than an off-site position would allow. On several occasions during the contact stage of the research, the researcher drove into Mfazazana in the field study vehicle. The aim of this exercise was for the researcher to become familiar with the community and for the community to become familiar with the researcher and the research vehicle.

Another result of this physical proximity to the research problem was an understanding of the tensions involved at the resource management level through informal interaction and sometimes social contact with resource managers and other authority figures which reconnaissance meetings preclude. Simply put, what Colvin (1992) himself laments in not being given the luxury of participant observation is reclaimed in this study by the

researcher having regular access to the above mentioned respondents which may have contributed to the Janus-faced position of the researcher in the perception of the respondents.

The first of these 'faces' was the awareness, on the part of respondents, that the researcher was 'local' in the sense that she lived close to the study area and so she was perceived as having a stake in the issues at hand. As a result trust was established. It should be noted that the researcher was not privy to an equal quality of social and informal contact with all the respondents. This may be attributed to the different perceptions the respondents had of the researcher, with the authority figures according the researcher the greatest social and informal contact and the crayfishers the least. In contrast, Tsawulwayo was accorded significantly greater social and informal contact by the crayfishers than the researcher.

The other facet of the researcher's position with regard to the research problem was the perception that the researcher was resident and yet not 'local' due to her affiliation with the University of Natal, Pietermaritzburg. This was further supported by the fact that her move to the southern KZN coast was known to be recent. From the community's point of view this was important in the fact that the researcher was perceived to be unbiased through her affiliation with University of Natal, Pietermaritzburg, which as an institution was considered to be unbiased. Thus the credibility of the researcher was increased due to this affiliation with the University of Natal, Pietermaritzburg. This position was affirmed on several occasions with the pulling out of an old University of Natal, Pietermaritzburg examination booklet which Tsawulwayo deliberately chose to use for

inscribing her notes in order to prove the University of Natal, Pietermaritzburg affiliation. This local yet distant relationship to the respondents allowed for an innocence to pervade when necessary and thus for the deconstruction process as outlined by Shurmer-Smith and Hannam (1994) to take place.

The relationship to local communities, afforded by the researcher's proximity to the study area, was essential in the selection of the research assistant and interpreter without which this research would not have been possible. Through the community's failure to elect a resident interpreter and guide in time for the start of the field research, the researcher chose to employ Tsawulwayo who was from an inland community to act as research assistant. Tsawulwayo provided the same 'neutral local' position to the research problem as the researcher, she had never seen mussels or crayfish before this project, and yet her inland Zulu resident position gave her an 'in' to the community. This 'neutral local' and inland resident status combined to remove her sufficiently from the community to be unbiased in their perceptions and yet allowed her to be close enough to understand these perceptions easily.

It is the opinion of this researcher that the particular circumstances surrounding the qualities of the research team were strong factors in the success of the data collection process. The research assistant, Tsawulwayo, was a woman of about 30 years old who lived close by but inland from the research area and in fact had family living at Mfazazana. She was Zulu speaking, fluent in English and she was accepted by the respondents as 'local'. The relationship between Mbili and Tsawulwayo was friendly and

despite language barriers there was a sense of mutual respect which pervaded the field research.

Without drifting into the psychological, Tsawulwayo's personal qualities may have also been instrumental to the success of the field work. She is a woman with presence and a quality of power which is respected by all who come into contact with her and which allowed for a seriousness of purpose to pervade the interviews which she conducted. Essentially the research assistant provided a way of understanding the research problem through a penetration of the local 'marine culture' which even as a Zulu speaker, the researcher's 'White student' status would have isolated her from the perceptions under examination.

Mbili, who was employed as field guide, was invaluable in having intimate knowledge of the study area but not of the project per se. This 'ignorance' of the research problem on the part of the guide may have afforded Mbili the opportunity to facilitate the collection of data, without jeopardising his position of being an 'initiate' in the eyes of the crayfishers.

The findings of the five research questions which examined the perceptions of the stakeholders who impact on *P. homarus* at Mfazazana were analysed in the following manner. Where appropriate and feasible information was presented quantitatively, otherwise the findings were represented in the qualitative manner in which they were elicited. The findings of the seven groups interviewed, the crayfishers and the resource managers, were arranged according to the five areas of enquiry as outlined above.

The method used to arrive at these findings was one where the raw interviews were collected and the main themes or recurring statements were extracted from the respondent's data. Where similarities in findings occurred across individuals, these findings were presented as a group. The choice to analyse the data according to the patterns of responses or themes as these were presented by the respondents is in keeping with a methodology which does not predetermine or precode the 'boxes' into which data will fall. This method of analysis opens the way to multidisciplinary discourse through the removal of specialist methodologies.

Conclusion

While this study and the ones highlighted above by Kiepiel and Quinlan (1995, 1996; Quinlan 1996), Harris (1996) and Colvin (1992) differ in method as well as in purpose, a new approach to tackling issues regarding human interactions with the environment is evident. There is a recognition that the division of knowledge into exclusive 'boxes' may well be part of the problem. The methodology of this study was one which aimed to address the research problem through a directing of the research questions by the conceptual framework in the collection of the qualitative data. In so doing, the research problem was addressed through a research design and methodology able to accommodate the diverse perceptions of the stakeholders regarding the sustainable management of the marine resource *P. homarus* at Mfazazana. At the same time a single conceptual framework of analysis was maintained across the stakeholders in order to accord meaning to the findings of the data.

The role of the research design and methodology to expose the perceptions of the stakeholders regarding *P. homarus* at Mfazazana, and in so doing expose the different relationships between the characteristics of the locality, which impact to produce the divergent perceptions of the stakeholders was achieved. The examination of this methodology challenges simple positivistic principles which deal in the tangible and the measurable, rather than that which recognises the existence of perceptions and therefore allows for a broader understanding of the problem.

Chapter 5. PRESENTATION AND ANALYSIS OF RESEARCH FINDINGS: THE PERCEPTIONS OF STAKEHOLDERS REGARDING THE MARINE RESOURCE *P. homarus* AT MFAZAZANA

Introduction

People's perceptions are influenced by their different experiences and positions relative to the biophysical, socio-economic and political conditions within which they find themselves. This difference in access to resources, natural or human is instrumental in the formation of environmental perception which determines environmental behavior. In terms of this study, this relationship between access to resources and resource management behavior results in the conflict over the management of the marine resource which is being played out between the stakeholder groups. It will be demonstrated that the human impact on *P. homarus* at Mfazazana is the result of patterns of use and control of the same marine resource by groups with differential access to political, social and economic resources.

The findings of the five research questions which examined the perceptions of the stakeholders who impact on *P. homarus* at Mfazazana will be presented in the following section. The stakeholders' perceptions of the marine resource will be examined through an identification of the factors causal and influential in determining these different perceptions. The way in which different underlying factors, such as differential access to resources, result in different stakeholder

behavior will be explored to gain better understanding of the conflict which is preventing the sustainable management of *P. homarus* at Mfazazana.

5.1 Profile of the stakeholders

A profile of the stakeholders as revealed through the questionnaire is important in contextualising the results of the qualitative data. Demographic characteristics, such as age, gender, income level and racial grouping act as strong factors in influencing how individuals perceive and respond to the world. Both qualitative and quantitative approaches have been used to understand the factors and structures influencing the perceptions and responses of individuals to the marine resource.

All 18 crayfishers interviewed are Black males, aged between 17 and 70. As indicated by Appendix 4, 78% of those crayfishers interviewed are pollers. Seventy two percent sell their catch in town and only 28% on the N2. Only two of the 18 crayfishers have licences, of whom both are pollers selling in town. Seventy eight percent of those interviewed indicate that they catch in groups and 89% sell their catch on an individual basis. The three individuals who sell in both town and on the N2 in fact do their own selling in town and employ other individuals to do their bidding on the highway. The average length of time which the respondents have been crayfishing is 11 years.

Therefore, the quantitative results of this study reveal the following profile of the individual engaged in the illegal capture and sale of *P. homarus* at Mfazazana. He is about 40 years old and has been crayfishing for about 10 years. He catches by poling in a group and sells alone in town to known customers. Thus the market for *P. homarus* at Mfazazana is most active in the restaurants, hotels and homes of surrounding towns and not on the N2. The profile difference of this crayfisher at Mfazazana from that indicated in the INR (1992) study may be the result of a problem of replicability between the two studies where different individuals were interviewed in both. This profile difference may also be the result of changes in the actual profile of these crayfishers due to the affect of increased control of the market area by resource managers on the N2.

Of the resource managers, 14 men, of whom five are Black and nine are White and one woman, who is White, were interviewed. It is significant that of the 33 respondents, 15 of whom are in positions of relative authority, only one woman was interviewed. It may generally be concluded that resource managers tend to be male and White while crayfishers at Mfazazana tend to be male and Black.

The proportion of the crayfishing community at Mfazazana the above 18 crayfishers represented, is not possible to ascertain. The inaccuracy of peoples' views are reflected in the fact that the figures quoted by the respondents of the total number of crayfishers ranged from 40 to 400. It is the opinion of the researcher however, that certain factors appear to support the NPB estimate of 100 crayfishers at Mfazazana. Not more than 30 crayfishers were ever observed on Mfazazana beach at the same

time by the research team during the course of the field work. The persistent encounters with crayfishers who had already been interviewed by the research team towards the end of the field research support the NPB estimate. The haphazard nature of selection on the beach and elsewhere over a fairly extensive period of time supported the notion that the research team had interviewed most of the regular and active crayfishers at Mfazazana. The figure of 100 crayfishers in total is high then as an estimate, but may account for occasional and seasonal crayfishers as fear of prosecution is balanced against profit during the holiday season. It should also be noted that the time of interviews would have precluded those crayfishers who leave the beach under the cover of darkness.

Insight into the proportion of divers to pollers who operate at Mfazazana and their fishing habits was gained during the course of the field work with the crayfishers. Given the time during which the interviews took place, it would have been expected that the divers, who catch during the day, would have been over represented as opposed to the pollers who catch at night. This was not the case and as indicated by Appendix 4, the pollers clearly outnumber the divers. This may be a simple indication of the proportion of divers in the community, or that as pollers catch before dawn, that they come off the beach only after 9:00 am. In addition there was a marked decline in the number of crayfishers visible on the two days following the first day of closed season in KZN, November 1, 1996, when the research team attempted a few final interviews. This indicates a general awareness of the closed season on the part of the crayfishing community at Mfazazana despite little mention of it in the

interviews. Respect for the closed season also indicates that the crayfishers recognize the legitimacy of the law.

5.2 Qualitative findings

The qualitative findings will be presented by theme and the responses of the stakeholders clustered around these themes. The following themes were based on the five areas of enquiry as found in Appendix 3 and discussed in Chapter 4. Where individuals held consistently common views to themes throughout the questionnaire process, these responses were presented together as a stakeholder group. Thus where perceptions were relatively homogeneous in the case of the crayfishers, perceptions were more heterogeneous in the case of the resource managers. Relative thematic consistency determined the regrouping of the findings as dictated by a commonality of response amongst the resource managers. Perceptions of the crayfishers will be presented together and the perceptions of the resource managers will be presented along five broad groupings: the KDNC, the NPB, the SAP, Resident Mfazazana members of the three Forums and Non-Resident Mfazazana members of the three Forums.

The stakeholders role in terms of, relationship with and responsibility to P. homarus

The perception of the stakeholders role in terms of and responsibility to *P. homarus* differs significantly across the stakeholders. These range from the strong economic relationship to the resource and minimal political responsibility by the crayfishers to the strong political relationship, with greater systemic awareness, on the part of the NPB and the KDNC. The Forum members and the SAP respondents demonstrate a more distant relationship to the conflict than the three other stakeholder groups.

The Crayfishers

All crayfishers indicated that they caught crayfish exclusively and that selling took place on the N2 and in private homes, hotels and restaurants in Port Shepstone and Durban. Speed and youth are indicated as prerequisites for selling on the N2 in order to evade police. Other than indicating either poling or diving as the preferred method of capture and therefore the tendency towards night or day fishing, no other details of the capture activity were mentioned by the crayfishers during the course of the interviews. All crayfishers indicate that their relationship with *P. homarus* is material; *P. homarus* is captured for the purpose of sale and should the commodity not be sold then it is consumed by the crayfishers. This qualitative data supports the profile of the crayfisher at Mfazazana as indicated by the quantitative data, as well as the findings of the INR (1992) study, except for the proportion of crayfishers selling on the N2.

Historical access to *P. homarus*, is indicated by more than half the crayfishers interviewed. Many indicate that their grandfathers and fathers had taught them to catch crayfish, and that it had been easier for their forefathers when no licence system was in place. Power over the resource is by historical association for the majority of the crayfishers. Thus the crayfishers' relationship to the resource is conceived in terms of an intragenerational access to the marine resource rather than by any politically structured precedent. It may be speculated that those not claiming historical access are relative newcomers to the area.

P. homarus' food value appears to be in competition only with its Rand value on the open market. The high monetary value of this resource results in the community selling rather than consuming it. Only those community members who can afford the loss of income incurred by eating the resource themselves will be able to sacrifice its market value. In addition, when crayfishers cannot sell all their catch, then too will *P. homarus* be consumed by them. Thus *P. homarus*, as a marine resource, is not in competition with other food items in terms of taste preference. Instead *P. homarus* is in competition in terms of the value per unit effort expended on its capture, where other marine organisms yield more food value for less effort. The crayfishers conception of the resource is indicative of the condition of absolute deprivation in which this group lives.

Little about the biology or natural environment of *P. homarus* was discussed, and comments regarding the animal itself were restricted to its feeding habits and thus the point of access to the crayfishery for the crayfishers. Discussion of conservation

measures, such as throwing back undersized animals and females in berry, was undertaken in terms of existing legislation but was starkly absent when discussing capture and sale methods. Two crayfishers indicated that they throw unsuitable animals back while seven indicated that they do not.

The discrepancy between the responses of the crayfishers regarding the conservation of *P. homarus* and discussions of the same animal in terms of capture and sale methods reveal the competing value of the resource in the perception of these stakeholders. When speaking theoretically, the conservation measures as imposed by the existing legislation are generally respected. However in terms of trade, the resource reverts back to the absolute value of food which takes precedence over conservation measures. That *P. homarus* is perceived in terms of a dual and competing value system by the same stakeholder group is an indication of the condition of absolute poverty which prevents sustainable development, rather than a rejection of conservation measures on the part of the crayfishers.

Half the crayfishers indicate that 'We' do not need to be controlled by 'Them', the resource managers, illustrating the exclusive nature of their relationship to *P. homarus* and the intrusion on this relationship presented by 'Them'. This intrusion is further illustrated by one respondent that 'this place is our place, and no one can tell us what to do' (Crayfisher 16, 15/10/96). The presentation of the 'Us' and 'Them' in a hierarchy of power where 'They' are in a position to control, is an indication of the crayfishers' low level of power relative to the resource managers (Goodey, 1974). The resentment of resource management is best illustrated by the incidents of

ambushing and rock throwing by crayfishers prior to November 1995 (de Beer, 12/09/96; Millar, pers comm).

There is a marked difference in the responses of the two crayfishers who have licences, though both continue to sell their catch illegally. Both regard the NPB favorably, both have more precise information regarding the regulation and habits of *P. homarus* than unlicensed crayfishers and both want more information regarding the biology and habits of *P. homarus*. Thus the level and quality of contact with authority structures appears to be decisive in the favorable perception of resource managers by these crayfishers as well as in the more responsible behavior displayed towards *P. homarus* than their unlicensed counterparts.

All 18 crayfishers indicated that they were unemployed. Respondents indicated that the law is ineffective because they are poor and rely on the capture and sale of *P. homarus* at Mfazazana to generate income. Half the respondents indicated that they use the money to support their families, pay school fees and to buy furniture. Thus a self-perception of absolute poverty may be added to the profile of the crayfisher. His position and socio-economic status, which is in part the result of the particular properties of the locality, leave him dependent on *P. homarus* as a source of income.

The dominant image of the crayfisher at Mfazazana is one of being poor and needing crayfish to support a family. One of the respondents whose self-portrayal originally conformed to this image revealed later that he had never been married and had no children. Giving false information in order to conform to the image of the

group of which he is a member is an important indication that the group is established enough to have formed a fixed image of itself which may false. The question is therefore whether the crayfishers can conceive of their relationship to the resource, not as one of complete dependence justified by absolute poverty, but as one of balanced management through environmental education and justified by the dictates of sustainable development.

There is a strong indication that the capture and consumption of the marine resource is differentiated on the basis of status, gender and history. It was widely indicated that men and boys not only caught *P. homarus*, but that they also ate it where as women and girls did not. In contrast women appear to collect mussels which are generally consumed. Several informal conversations during the course of the field work, support the idea that where an individual has high status in the community and where they are a longtime resident, it is more likely that the individual will have a taste for *P. homarus* and may even broker a crayfisher to procure one. The patriarchal nature of the Mfazazana community would thus support the consumption of crayfish by men.

The gender differentiation found at Mfazazana is supported by Kiepiel and Quinlan (1996) in the Transkei and is most likely the result of gender differentiation within the household where tasks are divided according to a system of patriarchy. Patriarchy determines that the most important or wealthier members of the household consume the most complex marine organisms. The differentiation by historical access may be understood as a result of inland cultural perceptions of marine organisms which

regard these as unfamiliar and thus inedible. The consumption of *P. homarus* by people of higher status is interesting in that it appears to refute perceptions held by the resource managers, as will be discussed below, that Mfazazana residents do not eat *P. homarus* by choice, but rather than by economic necessity when animals caught are not sold.

The point of entry into the market is different for different crayfishers. Many indicate that their fathers and grandfathers taught them to harvest crayfish. Other motivating factors include making money to finish school, the example set by others in the community already engaged in crayfish capture and sale as well as avoiding the possibility of committing other crimes, such as stealing which would 'put you in jail' (Crayfisher 3, 16/09/96). One crayfisher indicated that his interest in crayfish stemmed from seeing the price paid by Whites for mussels and oysters at Checkers and the OK Bazaars, while another indicated that catching *P. homarus* while working on a White boat at Ifafa had motivated him to catch his own. The crayfishers' relationship to the resource then is reaffirmed to be either by virtue of historical access or by association. The position of normality which the illegal capture and sale of *P. homarus* occupies in the perception of the crayfishers is significant in illustrating the conflict in stakeholder perception when considering how the same activity is perceived by the resource managers.

The Resource Managers

The members of the KDNC interviewed indicated that their relationship to *P. homarus* has been indirect until now. The organisation's responsibility regarding crayfish is to ensure the integrity of the natural system through extension and education work (See Appendix 1a). The KDNC's relationship to the resource is expressed through their stewardship of the biophysical elements of the marine environment and to a lesser degree extension work and education. The indirect relationship between the KDNC and *P. homarus* is consistent with the division of powers as outlined in the examination of the locality, which showed that the KDNC has had no jurisdiction over the resource in terms of law enforcement.

One KDNC respondent indicated a lack of confidence in achieving sustainable development on the KZN coast and as well as a perception of powerlessness that the KDNC cannot meet the environmental needs it represents in the face of development demands. It was perceived that a point of no return has been reached and there was little hope in merging environment with development without successful models of sustainable development on the KZN south coast. The sense of powerlessness of this respondent regarding the regulation of *P. homarus* is indicative of the wider position of powerlessness of the KDNC as the conservation organisation of an impotent former homeland government.

The NPB has a direct relationship to *P. homarus* which is consistent with its mandate to administer the Natal Ordinance, the intertidal fishery, conservation and

environmental awareness, law enforcement and data collection for scientific purposes at Mfazazana as indicated by its mission statement (See Appendix 1b). The respondent under whose jurisdiction Mfazazana falls, indicates that up to 25% of his time is spent managing *P. homarus*. The NPB's relationship to the resource is expressed primarily through the political context in terms of the authority mandated to the NPB, and to a lesser extent in terms of the biophysical property of the resource. The direct nature of the relationship to the resource is indicative of the relative power of the NPB, as opposed to the KDNC, over *P. homarus* which is consistent with the division of authority at Mfazazana .

The NPB perceives its responsibility to *P. homarus* as custodian of marine resources. Implementing sustainable use of the marine resource is perceived to be the essential factor in successfully carrying out this custodianship. This implementation process is to be achieved through law enforcement and the Environmental Awareness section of the NPB. This responsibility to the marine resource extends to the protection of the licence system and the rights of the 11 000 annual licensees.

Preservation of the status quo is represented by the perception of the NPB that licensees are the legitimate and thus primary users of *P. homarus* to whom the NPB is responsible, where as the crayfishers at Mfazazana are conceived as being illegitimate and a threat to the primary user. The crayfishers at Mfazazana, as illegitimate users, pose a threat to the NPB's primary relationship with the resource in terms of its mandated authority over *P. homarus*.

There is a recognition on the part of the NPB respondents that *P. homarus* plays a major role in the economy of KZN tourism in terms of the recreational user. The value of *P. homarus* to the NPB is thus systemic in terms of maintaining biodiversity, it is political in terms of the power entrenched through the protection of *P. homarus* and it is material in terms of the income generated from licensees. All NPB respondents indicate that extreme caution should be used in changing the present regulatory system to allow commercial off take, as the crayfishery in KZN can not be compromised for the crayfishers at Mfazazana. The material value of the resource, though not a primary concern, expressed in licence Rands and the power entrenched through resource protection, forms part of the status quo which the NPB wants maintained and which puts them in direct competition with the crayfishers for *P. homarus* at Mfazazana.

The SAP perceive their responsibility to *P. homarus* as being in upholding the law as this pertains to the marine resource and to the communities under their protection. Specific SAP involvement with *P. homarus* is indicated at low tides twice a month, when marine resource harvesting peaks, as well as with the daily traffic problems associated with the sale of the marine resource on the N2. Identification of the marine resource's economic value in terms of tourism as well as its value to the natural system is made clear by all SAP respondents. The SAP's relationship to the resource is firstly in terms of the political context and secondly in terms of its value to the natural system. The perception of the research problem is confined to the N2 and personal interaction with the resource appears to be minimal, which is in keeping with the structure of authority of the NPB and the SAP over the resource.

The minimal contact between the SAP and the resource suggests that this stakeholder group has an objective view of the research problem.

Those resident Forum members who are long-time residents of Mfazazana indicate that their primary role is to catch fish and that their relationship with the sea is historic. These respondents take an indirect and objective view of the resource. There is keen interest in terms of consumption and it is indicated that many people in the community eat crayfish because it 'tastes very nice' (Cele, 10/09/96). The pattern of consumption indicated by these respondents appears to support the idea of differentiated consumption based on status and historical access to the resource. Little mention was made of the responsibilities or relationship of the Community Development Forum at Mfazazana or that of the Community Policing Forum to the marine resource. The absence of discussion regarding authority over the resource is significant and may be indicative either of a lack of de facto authority over the resource, or a perception that the resource does not need to be controlled.

A relative new comer to the area, and Chairman for Rock Features on the South Coast Fishing Forum, indicates that he has a direct relationship with the crayfishers rather than with the marine resource as he did not like to eat crayfish. He indicated that the South Coast Fishing Forum would like to educate the crayfishers and help change the regulations governing *P. homarus*. The Forum is perceived as providing access, through him, to the government for the crayfishers, as he considers himself the popularly elected spokesperson for the community at Mfazazana. This individual's response further supports the idea of differentiated consumption of the

resource based on historical access. In addition this resident Forum member reveals a clear sense of purpose and power in contrast to the other resident Forum members regarding the conflict over *P. homarus*. This sense of purpose may be the result of his direct position to the formal structures of power on the South Coast Fishing Forum.

Non-resident Forum members signal a largely indirect relation to the marine resource. The limiting of over fishing of *P. homarus* is recommended and the pride which residents of the KZN south coast take in their marine resources is indicated. The value of *P. homarus* appears to be in terms of the material benefit from tourism as well as the systemic value of the animal in protecting biodiversity. The relationship of these respondents to the resource is located in the biophysical and socio-economic contexts of the locality through an indirect relationship to the resource.

As demonstrated above, the perception of their role in terms of and responsibility to *P. homarus*, by the stakeholders, differs significantly. The roles and responsibilities as perceived by the crayfishers and the NPB reveal the greatest degree of difference. The crayfishers do not indicate any strong sense of responsibility to the resource while their relation to the resource is characterized by a strong economic reliance on *P. homarus* to provide for their families. Consumption of the resource by Mfazazana residents appears to be gender, status and historically based. In contrast, the NPB indicate a strong sense of responsibility in maintaining the systemic value of the resource as well as control over its protection.

Conflict between these two stakeholders is highest as their respective relation to the resource clash, however better access to the political resources in the locality have afforded the NPB a position of power in the conflict. The role of the crayfishers in catching crayfish, is in direct conflict with the role of the NPB, which is to enforce the law and protect the interests of the licensees which the illegal capture of the resource contravenes. The crayfishers hold a utilitarian view of the resource where the NPB holds a more ecocentric view in terms of its philosophy of protecting the species for its innate value within the natural system, but is technocentric in the way in which it manages the resource. Both these stakeholders have a direct and thus subjective relationship to *P. homarus* where the other stakeholders have relatively indirect and objective relationships to the resource.

The existing division of power has facilitated the more distant positions of authority of the KDNC and the SAP to the conflict and the resource itself. The KDNC express a strongly systemic responsibility to *P. homarus*, while the SAP make greater issue of its law enforcement responsibilities as these concern the resource. Neither the KDNC nor the SAP indicate a strong sense of power to resolve the conflict. The KDNC holds a strictly ecocentric view of the resource where the SAP recognize the utilitarian and ecocentric value of *P. homarus* and thus hold an accommodatory view.

The one resident member of the Forum as well as the non-resident Forum members occupy relatively middle and accommodatory positions, as described by O'Riordan (1989) to the conflict and indicate both the material and systemic value of the

resource. The other resident Forum members indicate perceptions akin to the crayfishers regarding their weak sense of responsibility to the resource and they perceive themselves as having only a negligible role in the conflict. The separate, utilitarian quality of these respondents' relationship to the resource is indicative of a more technocentric leaning in the conflict.

Stakeholder perceptions of the role in terms of, responsibility and relation of other stakeholders to P. homarus

The perception of the role and responsibility of other stakeholders in terms of *P. homarus* differed significantly across the respondents. The crayfishers concentrate on the threat posed by resource managers and law enforcement to their trade. NPB respondents focus on the small-time illegal harvester, though the illegal syndicate harvester is also identified in the conflict over *P. homarus*. KDNC respondents identify the NPB, local communities, local government and developers, as well as the public at large as elements in the conflict at Mfazazana. Resident Forum members identify strongly with the interests of the crayfishers and indicate a sense of powerlessness to fetter either NPB and SAP involvement with the crayfishers or the intrusion of outside crayfishers into Mfazazana. These four stakeholder groups felt at odds with the others identified in the conflict over *P. homarus*. SAP and non-resident Forum members hold more distant positions to the conflict and indicate positive perceptions of the community at Mfazazana and of the crayfisher.

The Crayfishers

The crayfishers' perception of the resource managers and law enforcement at Mfazazana, identified exclusively as the SAP and the NPB, was generally negative. The majority of crayfishers indicated incidents of SAP and NPB abuse which included being left stranded in Bhobhoyi[6], being kicked with a stick and being crippled and paralyzed. Ten crayfishers indicated that the SAP and the NPB arrest crayfishers. Again the two licensed crayfishers stand out in their respect for the NPB. Encounters between the NPB, the SAP and the crayfishers are generally defined in terms of physically abusive law enforcement. Thus 'They', the resource managers, are easily, unanimously and objectively described and stereotyped as being in a position of power to abuse 'Us', the crayfishers. Consequently the crayfishers posit themselves as the stereotyped poor, unemployed and powerless victim of the SAP and NPB. As indicated previously, the licensed crayfishers stand out in their positive perception of both the resource managers and of themselves which may be due to more recent and more favorable contact with the NPB.

The resource manager, and more specifically the NPB, are perceived to be the most significant and powerful stakeholder in the conflict with the crayfishers over the marine resource *P. homarus* at Mfazazana. This power of resource management is perceived as both negative and positive by the crayfishers. In negative terms

[6] Bhobhoyi is an inland community about 25 km from Mfazazana.

resource management is perceived to be a threat to the crayfishers' livelihood and their power and opportunity to enter the consumer market. This power of the resource managers is further extended in their capacity to define and limit the conflict between the crayfishers and the resource managers; the crayfishers perceive the conflict to be limited to the market on the N2 despite the reality of the larger market provided to the crayfishers by restaurants and hotels. Positively, the resource managers, and more specifically the NPB, are perceived as having the power to motivate for a shelter so that sellers avoid the dangers on the N2. The power to do good is also accorded to the government which is perceived to be able to change the regulations to benefit the crayfishers.

Monitoring and law enforcement appear to have become blurred in the perception of the crayfishers. The resource managers' power to detain and incarcerate in terms of monitoring stocks, is widely acknowledged and one respondent indicates that he is 'scared of the monitors' (Crayfisher 7, 17/09/96). This blurring of management functions in the perception of crayfishers indicates that monitoring and conservation are correlated with law enforcement and merge as the sole point of contact between these two groups.

The resident crayfishers at Mfazazana do not perceive competition for *P. homarus* from outside crayfishers or buyers. The outside crayfishers are described by more than half the respondents as being White or Indian and some respondents indicate that they come from Durban. The relationship between the Mfazazana crayfishers and these outsiders is neither described positively nor negatively. Thus the

perception of the NPB as trespassers may be contrasted with these outsiders who are perceived in neutral terms. Buyers of *P. homarus*, who are generally described as White or Indian, are also perceived in neutral terms by the Mfazazana crayfishers.

The evidence provided by an analysis of the perception of 'Us' and 'Them' by the crayfishers indicates a differential access to power and resources across the stakeholders, as suggested by the political context of the locality. As if operating in a vacuum, the crayfishers feel unable to access power to affect change in the conflict except indirectly through the NPB and the SAP. Total power to do good and bad and act to resolve the conflict is thus accorded to 'Them' and more specifically to the NPB who are perceived as able to bring about change to resolve the needs of both the crayfishers and the resource managers. Outside crayfishers and buyers as well as the community at Mfazazana and other authority structures remain beyond the scope of the conflict in the perception of the crayfishers.

The Resource Managers

The KDNC respondents' perception of others involved in the conflict over *P. homarus* at Mfazazana differed most in the identification of who the other was. All KDNC respondents agreed that the NPB was primarily responsible for the protection of *P. homarus* in the coastal zone and one respondent indicated that it was the

responsibility of the NPB, the *Amakosi*[7] and the community to control the selling of *P. homarus*. TLCs who are ignorant of environmental legislation, holiday makers and a public unaware of its impact on the natural environment and developers of 'time-share' who do not respect the integrity of natural systems are perceived to be the greatest threats to biodiversity in the region by the KDNC respondents.

The KDNC respondents appear to perceive an expansive threat to the natural environment from most other authority structures and users of natural resources in the region. The perception of a different estimation of value of natural resources by the KDNC from other stakeholders underpins the perception of this wide threat. The resource users and local government structures are identified as being ignorant of the biophysical value of natural resources and the NPB's system of law enforcement, perceived to have poor reception by local Mfazazana residents, is seen to be ineffectual by these KDNC respondents. This perceived difference in resource valuation contributes to the conflict where different systems of value of natural resources compete for the power to influence.

The KDNC respondents indicate frustration in their failure to influence others over the value and management of marine resources. This frustration may be by virtue of the divided administration of conservation at Mfazazana as outlined in the examination of the locality. However, this frustration may also be the result of the KDNC's failure to provide environmental education as outlined in its mission

[7] The *Amakosi* refers to the individuals in a position of power in a Tribal Authority.

statement (See Appendix 1a). The absence of any mention of the KDNC by the crayfishers in their examination of the conflict indicates that the residents of Mfazazana have never had access to environmental education by the KDNC. The willingness to change existing relations between the KDNC respondents and other stakeholders and the suggestion to have tripartite authority between conservation, Tribal Authority and community can be understood as the product of this perceived inability to affect change in the management of natural resources.

It is generally agreed by KDNC respondents that the capture and sale of *P. homarus* is motivated by a lack of other economic opportunities in the region and carried out by young Black males selling on the N2. It is acknowledged that crayfish have been captured and consumed by local people at Mfazazana for a long time and that marine organisms are a traditional source of food to local populations. As crayfish sellers are observed running away from the 'green uniform'[8] (Anonymous, 09/96) of conservation authority on the N2, these sellers are perceived by the KDNC respondents to be fully aware of the illegal nature of their trade. The majority of buyers on the N2 are identified as being White and Indian.

The concurrence of the KDNC respondents with the delinquent stereotype of the crayfishers indicates the relationship between the KDNC respondents and the crayfishers in the hierarchy of human development. This hierarchy is clearly defined in the poor crayfishers selling to the affluent buyers on the N2. The KDNC is thus

[8] Both KDNC and the NPB officials wear green uniforms.

posited as an organisation rendered impotent by the development needs of the local population who are perceived to be too poor to do anything but deplete the natural environment. The local population is thus accorded responsibility for the depletion of the natural environment. This position of responsibility contrasts strongly with the divided and weak conservation administration and the breach of the KDNC's own responsibility within this administration as factors powerful in the depletion of the natural environment.

The adoption of the delinquent stereotype indicates the position of the KDNC in the hierarchy of power which is secondary to the power commanded by the NPB in this conflict. The objectivity and position of remove of the KDNC from the conflict is reaffirmed by the KDNC respondents' subscription to the dominant delinquent stereotype of the crayfisher. This subscription indicates the propaganda promoted by those in a position of power and accepted by those who are not.

The NPB perspective identifies the recreational crayfisher, the small-time illegal harvester and the illegal syndicate harvester as the main user groups who impact on *P. homarus*. It is widely acknowledged that the main culprit in stock pressure is unknown. The NPB perceive a distinction between those sellers on the N2 and other crayfishers who use a rod to catch *P. homarus*. The sellers on the N2 are identified as boys aged about 16 years, many of whom are refugees from other communities vacated during the unrest of the 1980s and early 1990s. These youngsters are perceived to be the pawns of adult ringleaders and are thus differentiated from the adult pollers. The youngsters are perceived to be unruly, have a tendency towards

gangsterism and use their income from crayfish to patronize *shebeens*[9] which is perceived to be instrumental in the area's increase in crime making law enforcement difficult.

The adult rod users are perceived to be unemployed individuals who catch crayfish to sell and to use for bait. It is the opinion of the NPB respondents that neither type of small-time illegal harvester are subsistence crayfishers because both catch crayfish to sell rather than to eat. According to the NPB respondents, individuals who catch for subsistence purposes harvest mussels, octopus and fish. NPB respondents indicate that there is no marketing of crayfish in Durban and that all small-time catches are sold locally.

The greatest threat to *P. homarus* may not be the small-time or artisanal illegal harvester but rather the illegal syndicate harvester (Millar, 13/09/96). The syndicate harvester dives and makes use of SCUBA equipment, fridges and power boats and has a greater impact on *P. homarus* than artisanal crayfishers as the syndicate harvester accesses both the inshore and offshore reefs. Offshore reefs provide the replenishing stock to the inshore reefs. The artisanal crayfishers can only access the inshore reefs by virtue of their more limited technology. The syndicated commercial harvester may be illegally targeting tribal areas due to the perception that these areas are isolated and that the access risk to the NPB will prevent regulation of

[9] *Shebeen* refers to a place found in former townships and elsewhere, where liquor is purchased and may be consumed, sometimes without a liquor licence.

these areas. Any further examination of syndicated harvesting of *P. homarus* at Mfazazana is beyond the scope of this study.

Thus for the purposes of this study, two distinct groups of crayfisher emerge in the conflict over *P. homarus* at Mfazazana: those crayfishers who threaten the security of the area in preventing law enforcement and those who are unemployed and catch crayfish to sell and to use for bait. Clearly the problem is not the unemployed crayfisher but the delinquent youngster selling on the N2. The threat from these youths is perceived not in terms of the threat to the biological fitness of *P. homarus* but rather the threat to the NPB and its law enforcement role.

The value of *P. homarus* to the community at Mfazazana is perceived by the NPB to be minimal and the value of crayfish to the small-time illegal harvester at Mfazazana is perceived in material terms by the NPB respondents. It was indicated that while *P. homarus* may appear on the platters of longtime Mfazazana residents, other marine organisms such as mussels and octopus are found most often on the plates of poor households (Kiepiel and Quinlan, 1995, 1996).

The NPB's perception of the conflict over law enforcement on the N2 provides evidence of the NPB's position in the hierarchies of power and human development. The power of the 'delinquent selling on the N2' stereotype in stakeholder perception indicates the power of the NPB in influencing perceptions of the crayfish harvesters by the other stakeholders. The perception of the crayfisher by the NPB and the KDNC is that of an exploited position where unequal access to facilities and

opportunities at Mfazazana, as compared to the White urban areas of former Natal, have created a hierarchy of human development with the crayfishers at the bottom.

Mfazazana is perceived to be different from other areas by the NPB respondents. It is different in the sense that there is a policing problem there where offenders can easily hide and prevent law enforcement. The 'passive urban environment' (Millar, 13/09/96) which is White, literate and wealthy is compared to the increased physical threats presented at Mfazazana, a former homeland area, where crayfish means survival and employment. There is a perceived difference in the attitude at Mfazazana where people are not intimidated by the NPB. The perception voiced by these NPB respondents is that the organisation is coming in for the first time without having had any interaction with the community before.

The recent penetration of law enforcement at Mfazazana indicates the ineffective system of control over marine organisms which existed in former KwaZulu under apartheid legislation. This environment at Mfazazana, where the residents have never been subject to law enforcement beyond the N2, is perceived to be hostile to NPB objectives. The NPB is perceived as a threat to the crayfishers' employment opportunities and access to the consumer market. Similar to the point presented by KDNC respondents, Mfazazana is perceived to be an uncontrolled area open to the combination of deprivation and syndicate greed which places the resource at the mercy of forces beyond the NPB's control. This picture is consistent with the one suggested by the examination of the political context of the locality which revealed

the divided administration of the resource at Mfazazana which has left it effectively uncontrolled.

The NPB's perception of other stakeholders includes the public at large, the buyers and the KDNC. The NPB's relationship with the KDNC is identified as one where the NPB could not work in their 'country' and they could not work in NPB 'country', thus the amalgamation means that these 'countries' are now merging (Broker, 01/10/96). The public is perceived as being unaware of problems associated with *P. homarus*. White and Indian buyers are perceived to be most prevalent on the N2 but with technology on the increase, illegal syndicate harvesters are coming from 'up north' and competing with local illegal harvesters and sports fishers for *P. homarus* (Broker, 01/10/96).

The absence of any significant authority structure other than the NPB involved in the management of *P. homarus* is indicative of the hierarchy of power in the management of the resource. The NPB both perceives itself and is perceived by the other stakeholders as the dominant authority structure over *P. homarus* at Mfazazana. The relationship between the KDNC and the NPB presented here of divided and ineffective authority is supported by the examination of the political context of the locality. Like the KDNC, the NPB too perceives a public ignorant of its responsibility to the physical environment. Furthermore, the threat posed to the resource from more sophisticated harvesting practices is a point of great concern to the NPB as an increased threat to their authority.

Overall, despite the NPB's position as the dominant conservation authority in the region, as an organisation, its members clearly feel powerless to uphold its authority in the face of an ignorant public, deprived Mfazazana residents and syndicated criminal activity. Indicated here is the perception of the NPB that its relative power over *P. homarus* at Mfazazana is the result of the political transition being experienced presently in South Africa. On a broader scale, the sustainability of the environment is perceived to be at the mercy of the development objectives of powers greater than those of the NPB.

The SAP do not have specific perceptions relating to the others involved with *P. homarus*. Crayfish harvesters are distinguished from crayfish sellers who are perceived to be rebellious 16 year olds who spend their money at the shebeen and thus present a considerable social problem. The issue of crayfish sold from latrines is indicated as an example of the uncontrolled sale of crayfish on the N2. Local residents, restaurants and hotels are not recognized as contributing to the market for *P. homarus* as the SAP respondents perceive west coast *J.lalandii* to be in constant supply.

The stereotypical and objective picture of 'Them', the incorrect siting of the market for *P. homarus* and the perceived abundance of *J.lalandii* by the SAP respondents are indications of their relative position in the conflict over *P. homarus* at Mfazazana. This pervasive stereotypical picture of delinquent highway sellers acts in support of the NPB's role as the dominant resource manager. The confirmation by the SAP that crayfish are kept in latrines until sold indicates that the NPB's command of the media

is greater than that of the crayfishers who do not hold the power to place the stereotype of the NPB as abusers in national headlines.

The SAP perceives the community at Mfazazana to be supportive of their actions and as a result the community is perceived to have benefited. Thus the SAP appear to have a more favorable relationship with the community than other authority structures which indicates that the conflict over *P. homarus* at Mfazazana is greatest between those stakeholders in direct competition over the same resource, the crayfishers and the NPB. This conflict, with regard to certain issues, appears to be the least between those stakeholders who perceive the need to put in place common management objectives, as in the case of the community and the SAP, who both identify the dangers on the N2 as priorities to be resolved for the sake of a safe and stable community.

The position of the resident Forum members in terms of human development is indicated in their identification of stakeholders in the conflict. The crayfishers fall into two groups: youngsters on the N2 and adults who support their families and who do not sell on the N2. Regulations in the case of the adult crayfishers are seen to be unimportant as they are perceived to catch *P. homarus* in a climate of poverty and unemployment. The NPB and the SAP are perceived as abusing the local crayfishers and outside crayfishers are identified as using the roads at Mfazazana without helping to maintain them. Buyers appear to be Indians and Whites on the N2 as well as hotels in surrounding towns as *P. homarus* was identified as being too expensive for most residents at Mfazazana. Men born at Mfazazana are identified as

eating *P. homarus*. The Resident Forum members assume a middle position between the crayfishers, in that they are able to buy crayfish, and the White and Indian crayfishers and conservation authorities, who are able to access roads, abuse the local crayfishers and use the resource against the interests of the community.

This perception of the crayfishers as a blend of the two dominant stereotypes, that of the delinquent youngster on the N2 and that of the poor unemployed crayfisher selling in nearby towns, reveals the relative position of the resident Forum members between that of the NPB and the crayfishers in the hierarchy of power. The consumption of crayfish by these Forum members supports the idea that these men occupy a relatively higher status in the community to that of the crayfishers but that they are sufficiently aware of the plight of the crayfishers to represent their cause in a more subjective way than the NPB stereotype (Goodey, 1974). Despite their position in the community and their contact with the crayfishers, the NPB perception of the problem dominates these resident Forum members' perception of the conflict which indicates the power of these stakeholders relative to the NPB. The powerlessness of the community is indicated by its inability to stop outsiders from accessing local resources which contributes to the spiral of decline in the local marine economy. This powerlessness is also indicated by the inability to prevent the perceived abuse of the crayfishers by conservation authorities.

The dominant stereotype of the crayfishers prevails amongst the non-resident Forum members. The concern with the health implications of storing marine organisms in latrines lays testimony to the role of the NPB as the dominant propagandist of the

stereotyped crayfisher. These respondents identify with the dominant NPB stereotype of the illegal crayfish harvesters as delinquent youths very aware of the illegal nature of their activity. Members of this stakeholder group differentiated between the crayfish sellers and the crayfish harvesters and perceived the material value of *P. homarus* to the illegal harvester at Mfazazana.

The longstanding relationship between the local residents outside Mfazazana and the crayfish sellers reveals the different notions of legality which exist in the perception of these non-resident Forum members of the same activity across time and space. Black crayfish sellers were identified as having always sold to local residents outside Mfazazana in a 'controlled manner' (Diener, 12/09/96) in contrast to the recent trade where crayfish were being kept in latrines by ignorant crayfish sellers and sold to an unknowing public. The 'Us' and 'Them' patterns appear to shift when 'They' are selling in the respondent's own intimate and known world in a 'controlled manner' (Diener, 12/09/96), rendering the activity acceptable. This same crayfisher is perceived as a criminal who sells tainted food to an unknowing public on the N2.

This difference in perception of the same activity and individual across different time and space is the result of particular factors of the locality. The divided and differently applied administration across former KwaZulu and former Natal of marine resource regulation, as promoted by the apartheid government, legislated for separate development. One individual lived in the homelands and illegally sold crayfish on state roads and the other individual operated outside the former homelands in a

legal capacity to the benefit of the local inhabitants. The political factors which brought about this dualism in the perception of crayfishers may explain how other stakeholders have come to regard the same activity in a dualistic manner. The present period of transition in which former KwaZulu and former Natal are becoming subject to the same system of law may have propelled this longstanding problem of illegal resource use into the limelight.

The perceptions by the stakeholders of others involved in the conflict over *P. homarus* at Mfazazana reveal how the stakeholders relate to each other and access power within the locality. The NPB and the crayfishers identify in each other the most significant opponent in the conflict as indicated by the subjective description of each other where other stakeholders are seen objectively (Goodey, 1974). The crayfishers indicated that NPB and SAP abuse and law enforcement have been the only points of contact between conservation authorities and most of the unlicensed crayfishers. Overall the crayfishers indicate a sense of powerlessness to resolve the conflict which they perceive the NPB empowered to mitigate a solution to. The absence of any mention of the Forums by the crayfishers questions the representativeness of both the community's representative on the Fishing Forum as well as of the Forums themselves in representing the interests of the crayfishers. All the stakeholders identify the crayfishers' utilitarian relationship to the resource.

While the NPB identify three major harvesters in their concern for *P. homarus* at Mfazazana, the delinquent youth selling on the N2 is identified at the center of the conflict over the threat to law enforcement. While this stereotype of the problem and

the offender dominates the perceptions of the other stakeholders and ensures the NPB their position as the dominant conservation authority, the NPB continue to perceive their efforts at conservation as being at the mercy of development powers greater than their own.

The KDNC perceive a great deal of conflict from other stakeholders involved in conservation as perceptions of different value systems compete for influence. Revealed is the administration which keeps *P. homarus* uncontrolled and which facilitates the KDNC's failure to provide environmental education to the residents of Mfazazana. Both the NPB and the KDNC perceive the public's ignorance of marine conservation as a threat to marine resources.

Resident Forum members identified strongly with the interests of the crayfishers and cite incidents of NPB and SAP abuse. An overriding sense of powerlessness to resolve the conflict over *P. homarus* at Mfazazana indicates that this stakeholder group is only slightly better able to access the resources of power than the crayfishers. The resident Forum members share with the NPB, the negative perception of outside crayfishers coming into Mfazazana, though the resident Forum members are unique in perceiving these outsiders as users of resources against the better interests of the community .

The Non-resident Forum members maintain a distant position to the conflict but indicate the long practiced system of different laws across time and space which evidences the NPB's failure to consistently enforce the law. The SAP also maintain a

position of distance to the conflict though community support for law enforcement at Mfazazana was indicated by these respondents. The SAP identify with the dominant NPB stereotype of delinquent youths selling on the N2

Perceptions of present regulation of P. homarus

The perception of the present system of regulation of *P. homarus* differed significantly across the stakeholders. The crayfishers want the present licence system eliminated as *P. homarus* is perceived not to need regulating. The NPB respondents indicated that regulation is mandatory to ensure the fitness of the species and are wary of changes to the present system of regulation. Both the KDNC and the SAP doubt whether eradication of illegal harvesting and selling of crayfish is possible, but both feel that regulation of *P. homarus* is necessary. A majority of resident Forum members call for an end to the present licence system while a minority indicate that regulation of the animal is necessary. Non-Resident members do not register a perception of the present regulation of *P. homarus*.

The Crayfishers

The crayfishers clearly define the NPB and the SAP as the regulatory bodies charged with the monitoring of stocks and some crayfishers indicated that they believe that the government regulates the sea. The absence of any mention of the

KDNC by the crayfishers is indicative of the structure of authority in place which excludes them from regulating the crayfishers at Mfazazana. It also indicates the KDNC's failure to fulfil its responsibility as outlined in its mission statement to provide environmental education to the residents at Mfazazana (See Appendix 1a). Many crayfishers indicated that there is no need for *P. homarus* to be regulated and their inability to catch freely is generally resented and misunderstood. It is perceived that *P. homarus* is created by God and as such does not need to be regulated by people as the crayfishers keep to the law. An overwhelming number of crayfishers indicated that the policy can be changed to benefit them.

The crayfishers' understanding of the regulations governing *P. homarus* is good except for closed season regulations which is not mentioned explicitly by any of the crayfishers interviewed. All crayfishers understand that a licence is required to catch crayfish and more than half the respondents know about the regulation pertaining to females in berry, undersized animals, the bag limit, the preclusion of sale from the regulations and the throw back requirement. This is significant given that sixteen of the crayfishers are unlicensed and thus have presumably not had contact with the NPB and the accompanying regulatory education which the licensed crayfishers are privy to. The licensed crayfishers demonstrated a more precise understanding of the regulatory mechanism governing *P. homarus*.

The crayfishers at Mfazazana perceive that they are practically regulated by a different law than that found elsewhere. When a crayfisher was invited to go crayfishing at Port Shepstone the week before he declined saying that he was

scared to do an 'illegal thing' (Crayfisher 7, 17/09/96). This perception on the part of the crayfisher is the same in reverse as that revealed by the non-resident Forum member that crayfish had always been traded in a controlled manner between former KwaZulu and former Natal and demonstrates that different laws are operating across time and space. Rules act as resources rather than as binding instructions in a political climate which is known to have explicitly promoted the different application of laws across time and space for different race groups.

The crayfishers' more positive and indirect relationship to the regulations governing the capture and sale of *P. homarus* contrasts with their direct and generally negative experience of the regulators. Their criticism of the regulations indicates an empowerment to change the present system while the discussion of the regulators reveals their impotency in a vacuum where the power of the law is felt externally by the crayfishers through the offices of the NPB and the SAP. No internal controls as regards the management of the resource was present in the perceptions of the crayfishers which is consistent with a legal structure which has never come to bear on these individuals in any consistent or coherent way. This inconsistency is suggested in the locality where divided and ineffective administration of marine regulations indicates a hierarchy of power experienced differently by the different stakeholders in the locality.

The crayfishers perceive the policy governing *P. homarus* to be ineffective. The majority of crayfishers indicated that despite the regulations in place, people still catch *P. homarus* without a licence. Reasons given for this non-compliance include

the 'expiry time' (Crayfishers 1-5,16/09/96; Crayfishers 12,13, 30/09/96; Crayfisher 14, 13/10/06; Crayfisher 17, 16/10/96) of the licence which is perceived to be too short and the expense of the licence, which for many is too high. The identification of the closed season as the expiry time rather than the result of the animal's reproductive cycle may signal the crayfishers misunderstanding of closed season regulations. The crayfishers' perception of the regulations as a threat to their employment and access to the consumer market signals their absolute and relative deprivation as illustrated by the crayfishers' self perception as occupants of the lowest position in terms of human development also shows that no environmental education has been taking place in this area.

The crayfishers' aim to catch freely and their belief that they adhere to the regulations governing *P. homarus* despite evidence to the contrary threatens the biological fitness of the animal and directly opposes the dictates of sustainable development. That undersized animals and females in berry are not being thrown back due to the animals absolute food value to the crayfishers, contravenes the crayfishers' symbiotic relationship or communal approach to resource management and challenges the assertion that crayfishers at Mfazazana are regulating themselves. The present system of regulation sets out to ensure the sustainable management of the resource. Persistent violation of these regulations threatens the reproductive potential of *P. homarus* which reduces population numbers to the detriment of the animal's sustainability (Fielding and Robertson, et al 1994; Fielding, 1995). The dominance of the crayfishers absolute value of the resource over the

relative value of the resource in their behavior is a function of their position in terms of absolute and relative poverty.

The Resource Managers

The KDNC's perceptions of the present regulation of *P. homarus* are variable. It is agreed that *P. homarus* should be regulated and that present regulations are generally ineffective. The law is found to be applied differently in different sectors which concurs with the perception of different regulation of activity across time and space by conservation authorities in the region as supported by the crayfishers and the non-resident Forum members. The present legislation is found to be adequate but uneducated magistrates, under staffing, low fines and the weight on the NPB to prove criminal action undermines the effectiveness of present legislation has led to a ' Tragedy of the Commons'[10] (Kay, 14/10/96).

The KDNC respondents indicate that the present system of regulation is important for ensuring the sustainable management of the resource. The dominant perspective of the KDNC is that *P. homarus* is not being sustainably managed at present and that the conflict over this marine resource is irreconcilable. Overall the KDNC respondents appear to have the greatest faith in the present regulations, as opposed to the system of application of those regulations. The perception that the

[10]*The Tragedy of the Commons* concluded that 'freedom of the commons brings ruin to all' (Hardin, 1968). The assumption was that when resources are limited and publicly owned, it is rational for each individual to over exploit them, even though the behaviour results in tragedy for the group. Hardin's (1968) solution was either to privatise the commons or to keep them as public property, to which rights of entry and use could be allocated.

KDNC has contributed to the ineffective management of the resource is not indicated by these respondents.

All NPB respondents agree that regulation of *P. homarus* is necessary in order to achieve their mission statement which emphasizes the fitness of the natural environment (See Appendix 1b). The sustainable use of marine resources elsewhere along the coast where regulations are consistently respected by users is perceived to be effective and thus establishing the exact extent of the crayfishery is unimportant in assuring sustainable management of *P. homarus* at Mfazazana. The effective functioning of the regulations in other areas along the coast is indicated by the daily stock monitoring carried out by the NPB. This stock monitoring is important in the effective management of the resource, but the blurring of stock monitoring with law enforcement is problematic in that resource management by the NPB becomes associated with punishment in the perceptions of the crayfishers. More effective law enforcement is expected with the amalgamation of the NPB with the KDNC where combined conservation efforts were unfeasible in the past. Support for the amalgamation, due to the extension of control which this union initiates indicates the NPB's faith in the existing structure.

Factors preventing the successful regulation of *P. homarus* as identified by the NPB respondents include inconsistent flow of information between bodies relating to *P. homarus*, difficulty in identifying community representatives for the Fishing Forums, lack of interaction with the community and a holiday season which coincides with the closed season. An inadequate mandate which does not allow the NPB access to the

community at Mfazazana and does not accord a law enforcement capacity to any other organisation working in the area, as well as a frustratingly flawed legal system, are also indicated as constraints by the NPB respondents. Perceptions of inconsistent regulatory application by the NPB in the areas surrounding Mfazazana do not come to the fore. Constraints to the sustainable management of *P. homarus* may be understood as a lack of common management objectives between conservation authorities and the users of the resource intensified by the neglect of both the KDNC and the NPB of their responsibilities to protect *P. homarus* (See Appendices 1a, 1b).

The SAP respondents identified the relationship between illegal crayfish harvesting and other crimes as being a strong motivator for the regulation of *P. homarus*. Fines are perceived to be too light and an ineffective regulatory system is seen as the result of a constant market on the N2 for *P. homarus*, which prevents the eradication of the trade. A heterogeneous resident community along the coast resulting from heavy in-migration in the recent past, is identified by SAP respondents as producing a political climate at Mfazazana which has few internal controls. This lack of internal control in the community is cited as a main reason for the continued illegal harvesting and sale of the marine resource.

The combination of a socially unstable community in which few internal controls exist and an inconsistent authority, both formal from the KDNC, the NPB and the SAP and informal from the Thulini Tribal Authority, are perceived by the SAP to play a role in the production of the conflict. Evidenced is the hierarchy where power over the

resource is not held by the community but rather outside it by the NPB who are an organisation in transition. Thus power over the resource is ultimately relatively distant and unstable while the local community holds little power over the natural resources in their area. The NPB stereotype of delinquent youths is employed to justify the more vigilant regulation of other associated crimes originating on the N2 at Mfazazana which suggests rules acting as resources.

God as regulator was cited by the majority of resident Forum members as justification for the removal of regulations pertaining to *P. homarus*. The regulations are perceived to be ineffective as long as the crayfishers are jobless and need an income to support their families. It was perceived by some that Whites could take as many crayfish as they wanted but that Blacks could not, indicating that rules may be applied differently across time and space. The racial component of this perception is consistent with the past apartheid government who legislated rules as resources to maintain a hierarchy of power and human development which put Black people at the bottom and White people at the top. One of the respondents indicated that the older men at Mfazazana would not adjust to change easily but that without regulations there would be no crayfish in the future.

The majority of resident Forum members support the crayfishers contravention of the regulations as they are perceived to be supporting families with the income generated from the sale of *P. homarus*. This support for the 'norm' of crayfishing and selling illegally at Mfazazana and the fatalistic view of the relationship between God and the perceived biological fitness of the crayfish constitute a threat to the

resource. As indicated by the biological data, control of undersized fish and females in berry as well as the closed season are essential in the survival of the species. These resident Forum members act indirectly to threaten the crayfish at Mfazazana in their failure to apply the informal external controls to the crayfishers in terms of their responsibility by association with the Thulini Tribal Authority. The forum member's perception of the importance of regulations in the sustainable management of the resource indicates the greater degree of contact which this individual has had with conservation authorities outside the capacity of law enforcement. The result is an individual with a favorable view of the regulations and the commercial sale of the resource under controlled conditions.

The response of the non-resident Forum members is limited to their concern that *P. homarus* is being over fished and that too many licences are being issued, as their contact with the regulations controlling *P. homarus* in KwaZulu-Natal is irregular.

Perceptions of the regulations pertaining to *P. homarus* at Mfazazana differs considerably across the respondents, however all stakeholders agree that the resource is not being effectively regulated at Mfazazana. The crayfishers and the majority of the resident Forum members feel empowered to call for an end to the present licence system which is perceived by these two stakeholder groups to be hampering the crayfishers' generation of income. The majority of crayfishers demonstrate a good working knowledge of existing legislation pertaining to *P. homarus*, despite being unlicensed, except for closed season regulations. The

crayfishers and the resident Forum members support a Communal approach to management of *P. homarus* at Mfazazana.

The NPB, the KDNC, the SAP and the minority resident Forum member indicated that the present system of regulation of *P. homarus* needs to stay in place. The NPB demonstrate a keen interest in maintaining the present system of regulation calling on the capacity of this system to sustainably regulate marine organisms elsewhere on the coast. The KDNC indicate that the present system of regulation is necessary to ensure the fitness of *P. homarus* at Mfazazana but that various factors prevent the effective regulation of the species. The SAP identify the importance of maintaining the present system of regulation in keeping associated crime down. Neither the SAP nor the KDNC perceive that the illegal harvesting and sale of *P. homarus* will ever be eradicated from Mfazazana. The NPB, the KDNC and the SAP support an Interventionist approach to regulation of *P. homarus*.

The failure of the NPB and the KDNC to fulfil their responsibilities to *P. homarus* at Mfazazana, as outlined in their mission statements, is indicated by the absence of any mention of the KDNC by crayfishers and the inconsistent application of the law across time and space by the NPB.

Future regulation of P. homarus

Perceptions of how *P. homarus* could be sustainably managed in the future differed across the stakeholders though they generally held a positive view of future management initiatives. An interventionist approach to management of the resource is shared by the NPB, the KDNC and non-resident Forum members. The crayfishers, SAP and Resident Forum members generally take a communalistic approach to managing the resource where the maintenance of resource monitoring indicates an interventionist view.

The Crayfishers

The crayfishers' perception of regulation and management options for *P. homarus* relate almost exclusively to changing the present system of regulation. The most contentious issue is that of the licence which more than half the crayfishers want removed. Other proposed changes include an extension of the licence and an increase in the bag limit. An opinion expressed by just over a third of the crayfishers was that no regulation was needed of *P. homarus* as they would continue to crayfish anyway.

Discussion of regulations pertaining to *P. homarus* is irrelevant to that third of crayfishers who indicated that they would continue to crayfish despite rules to the contrary. Whether the closed season, undersized fish and females in berry are

controlled by licence or not, these three regulations are pivotal to the survival of the species. This irreverence for the law stems from three interlinking factors particular to the locality: the absolute food value of *P. homarus* to the crayfishers, the inconsistent authority brought to bear on these individuals and the resulting lack of social connection which these crayfishers have with the society in which they live.

The absolute value of crayfish to a third of the respondents is one of food. Whether harvested to sell and obtain money or to eat, crayfish represent a way to improve the quality of life and the means of survival which regulation of the resource is perceived to prevent. The maladministration of the regulations by the agencies of authority charged with the task at Mfazazana have prevented the effective control of the resource and its harvesters. As outlined previously, this maladministration is due to a structural division of responsibility as well as a failure of agency to effectively undertake the responsibilities outlined in its mission statements in terms of environmental education and law enforcement (See Appendices 1a, 1b).

The uncontrolled nature of the crayfish harvesting has resulted in a harvester who is unused to being subjected to the judicious functioning of the law. This 'outlaw' has been uncontrolled both in terms of the nature of his catch and in most other spheres of his life lived in a community prone to past instability (de Beer, 12/09/96). This lack of control by society of the crayfisher and his activities has precluded the formation of bonds of attachment, commitment, involvement and belief in that society and its judicial system. This preclusion of social bonds has contributed to the depletion of the natural environment.

The perception by crayfishers that they are currently adhering to the law produces a perception that no regulation is necessary of *P. homarus* at Mfazazana. This perception of legal adherence may be the result of a selective adherence to the regulations which is disregarded when economic necessity overtakes the dictates of the relative value of the resource. Several respondents indicated that they are upholding the law in keeping to the legal size and bag limits. A minority of respondents indicated that both *P. homarus* and the crayfishers themselves need to be monitored for the future of their children and the crayfish itself. These respondents may have had contact with conservation authority which was not limited to law enforcement.

Overall, the evidence suggests that the law pertaining to *P. homarus* is not being adhered to by a majority of crayfishers at Mfazazana, and thus future initiatives in the sustainable management of the resource will have to include education programmes which ensure non-selective adherence to the law as required for the fitness of the species. Marine resource depletion in the former Transkei indicates that people do have the power to deplete the reserve of marine organisms to the point where the biological fitness of those resources is threatened. The impact of a depleted marine environment, on human populations who depend on it most, takes the form of a spiral of decline in the marine economy which adversely affects the quality of human life in terms of diminished human development.

The nature of future regulation of the resource as suggested by the crayfishers takes the form of change in the present regulations and more specifically the removal of

the licence system and the legalization of the sale of crayfish. They suggest that a shelter be built so that crayfishers do not sell their catch on the N2 and that three or four residents be appointed to monitor crayfishing affairs at Mfazazana instead of the NPB. A reference to syndicate harvesting was made when it was suggested that the NPB regulate the deep sea rather than artisanal crayfishers because the deep sea crayfish harvesters use boats. Finally a stop to NPB and SAP abuse was requested by many crayfishers in terms of resolving the conflict.

Crayfishers generally have a positive view of *P. homarus* and its future management. An interesting combination of ecocentric and technocentric tendencies emerged in the crayfishers' conception of future management objectives for the resource. The redistributed power into a decentralized system of control where the community takes greater responsibility for monitoring the resource results in 'They' not having the power to abuse and indicates an ecocentric approach. The suggestion that monitoring should continue and that a shelter should be built to allow for an orderly system of sale is indicative of a technocentric solution to the sustainable management of the resource.

The Resource Managers

The resource manager's perception of management options in achieving the sustainable use of *P. homarus* differs substantially from those of the crayfishers. Despite little faith that the capture and sale of *P. homarus* would ever cease, a time

factor perceived to be critical in avoiding total depletion and a lack of sustainable management models on the KZN south coast, the majority of KDNC respondents remain optimistic that *P. homarus* can be managed sustainably. The issue of time coupled with the potential pessimism resulting from a lack of precedent for a successful model of sustainable use are perceived to undermine the sustainable management of the resource.

KDNC respondents identified a number of goals which need to be set for the sustainable management of *P. homarus*. Fostering positive interaction with the community through talking directly with the people rather than just the Amakosi, and shifting the perceptions which conservation organizations have of communities are prescribed in resolving the conflict. Important in bringing about these changes is the amalgamation of the KDNC and the NPB in alliance with the SAP. Acting in a powerful marriage of conservation authorities, this alliance would be able to foster a climate of honesty within the community through joint responsibility of law enforcement and environmental education.

The redistribution of power over the resource where it is shared by conservation authorities and the community represents a shift towards an ecocentric approach, while the maintenance of existing authority structures as implied by the support for the amalgamation of the KDNC and the NPB is technocentric. Better documentation of the problem, increased manpower and education projects as well as the seeking of alternative sources of income for the crayfishers while working to remove the market for *P. homarus* are recommended by KDNC respondents. Highlighted is the

role that ecotourism can play in resolving the conflict and promoting conservation through a three-way partnership between the KDNC, private development and the local community in terms of identified entrepreneurial skill. These recommendations represent an interventionist perspective on resolving the conflict. The application of science with managerial ingenuity, combined with a recognition of market forces represents a shift away from a simple regulated system of resource management.

The role which the market plays in the overall problem supports the notion that 'luxurisation' and undervaluation of resources result in their over utilization, which is evident in these KDNC perceptions (van Sittert, 1992; Kiepiel and Quinlan,1995, 1996). Luxurisation is the process where the luxury status of the resource drives the price and the demand for that resource up to the detriment of that resource's sustainability. Undervaluation occurs when perceptions of abundance and the low status of the harvester push the price for a resource down without necessarily dropping demand to the detriment of the resource. Both luxurisation and undervaluation involve different perceptions of resource scarcity.

The difference in human development and income levels between the Mfazazana crayfishers and the surrounding residents and visitors (See Figure 3.2) leaves the opportunity open for the illegal trade of luxury resources between these two income groups. The nature of relations between the poor crayfishers and the rich buyers in terms of low level technology, perception of abundance by both buyer and seller, as well as the inconsistent value of marine organisms by the crayfishers has

inadvertently created an economy which undervalues *P. homarus* and contributes to its potential depletion.

The luxury market in *P. homarus*, related to the depletion of West Coast rock lobster *J.lalandii* (van Sittert, 1992), produces a luxurisation of *P. homarus* at Mfazazana which threatens its fitness. This luxury market is exploited most by the syndicate harvesters who benefit the crayfishers at Mfazazana in inflating the price for the resource and further motivating the illegal capture and sale of *P. homarus*. These syndicate harvesters exploit the resources of an area under little legal control with more sophisticated technology than resident crayfishers. This lack of control and higher technology gives syndicate crayfishers the means and the incentive to illegally supply a resource which they deplete to their short-term economic benefit when scarcity drives the price for *P. homarus* still higher.

The interventionist perceptions of the NPB are aligned to those of the KDNC save for the NPB's recommendation to maintain the status quo. The need for *P. homarus* to be regulated is made clear by all NPB respondents and considerable concern is shown regarding the long-term sustainability of the crayfish under present and proposed management frameworks. Clearly identified is the unfeasibility of a commercial fishery and the importance of maintaining offtake for subsistence purposes only, as subsistence and artisanal access rights to the marine resource pose a potential threat to its sustainability.

Future management initiatives regarding *P. homarus* by the NPB appear to center around their concern in identifying a target audience, which is important in their commitment to combine law enforcement and environmental education. NPB respondents indicate a need to know where stock pressure is coming from, which individuals or sectors of the community should be approached towards alleviating stock pressure and discovering what proportion of the community's diet is made up of crayfish in assuring the sustainable management of the resource. The syndicate commercial crayfisher, the small-time local harvester, school children, magistrates, prosecutors, the SAP and local authorities are identified as a target audiences for future management plans and environmental education regarding *P. homarus*.

The concern over what proportion of the crayfishers' diet is made up of crayfish in distinguishing the subsistence crayfisher from the small-time illegal harvester at Mfazazana has profound implications for policy. In short the nature of the relationship between the resource and the consumer, crayfisher or buyer, is always material. The difference between the crayfisher and other consumers is the different levels of human development across these groups which allows them differential access to the resource based on income. Under scrutiny here is the wisdom of classifying any luxury marine resource according to the same constraints as other common marine resources such as mussels or octopus. As long as the material value of the resource is high by virtue of its luxury status on the open market, wealthy people will consume it and poor people will sell it. Thus, making a luxury resource subject to the regulations governing subsistence harvesting is to further entrench poverty and lawlessness in the harvester. In addition, unrestricted power to

undervalue the resource is accorded to the buyer in response to the seller's poverty. This single classification of differently valued resources has the strong possibility of further promoting the luxurisation and undervaluation of marine resources which threatens the sustainability of these resources (van Sittert, 1992; Kiepiel and Quinlan, 1995, 1996).

Constraints to the successful management of the marine resource center around changes to present legislation which are viewed negatively by NPB respondents. The sustainable use of the marine resource is the function of the NPB's law enforcement and Environmental Awareness section. Despite the value of public participation, the perception is that the sustainability of the resource through the existing legislation is not negotiable. Closed season is recognized as crucial in providing a biological safety valve to *P. homarus* which functions successfully on the rest of the coast. A lack of regional interest in proposed marine resource management legislation as well as the continued disregard for the present law on the part of the crayfishers at Mfazazana are indicated as additional pressures to the integrity of *P. homarus* and the intertidal system.

Concern is apparent in the NPB respondents regarding the management implications should the resident crayfish harvesters at Mfazazana be given special status. The perception on the part of these NPB respondents is that the crayfishery should not be compromised for this small segment of society as objections are bound to come from other crayfishers over equality in commercial access. Management fears of potential changes in commercial access rights to *P. homarus*

are related to the NPB's interest in maintaining the present licensing system found to sustainably manage marine resources elsewhere along the coast. However, managing a non-commercial licence system together with a commercial licence system able to meet the needs of all users should be balanced against the more complex mismanagement of 11 000 legitimate licensees and however many thousand illegitimate crayfishers who threaten marine resources in operating outside the law which they cannot afford to adhere to.

Overall SAP respondents indicate a relatively positive view of the future management of *P. homarus* at Mfazazana. They aim to foster more trust in the police and more awareness of the laws related to *P. homarus* in the public so as to prevent the loss of lives on the N2. It is recommended that a formal local market be built and managed and that conservancy laws be changed to give licences to the people who depend on *P. homarus*. It is indicated that NPB manpower should be increased and their search and seizure powers amplified. More information and better communication is requested of the NPB so that the SAP may better educate themselves and the public at large and determine the role of police in managing *P. homarus* sustainably. Suggestions of change to the existing regulation of *P. homarus* are an indication that the SAP have a different relationship to the resource than the NPB which is not in competition with the crayfishers over the management of the resource.

The resident Forum members demonstrated a positive view of the future management of *P. homarus* at Mfazazana and agree that crayfish stocks need to be

monitored. Their aim is to get sellers off the N2 and to establish exclusive access rights at Mfazazana so as to stop outside crayfishers from using the resource at Mfazazana. They recommend that a formal, legal and sustainable market place be set up and that resource education in Zulu be offered to local crayfishers as it is perceived that most crayfishers at Mfazazana do not understand the reasons for the laws regulating *P. homarus*. It was indicated by one resident Forum member that if crayfishers continued to 'make corruption' with the NPB that the NPB would always be 'watching' the crayfishers (Mtaka, 09/10/96).

Like the SAP, these resident Forum members take a communalistic position on managing the resource, which is represented by a perceived need for increased community responsibility over the management of *P. homarus* in conjunction with continued monitoring of offtake. These resident Forum members suggest a resolution to the conflict between the crayfishers and the NPB in maintaining the relationship to the benefit of the people through the continued monitoring of the resource. Environmental education in the mother tongue of those under instruction rather than that of the instructor is important in resolving this conflict. The perception on the part of conservation authorities that crayfishers are deliberately defying the law is redefined by the community members who indicate that an awareness of punishment rather than the law makes the crayfishers run from conservation authorities.

A relatively positive outlook regarding the future management of the resource may be recognized in the responses of non-resident Forum members. A set of rules

applicable to everyone involved with *P. homarus*, which is easy to understand and to enforce is recommended in adjusting to the new political dispensation. A legal outlet for the crayfish sellers is proposed in order to avoid the dangers in selling on the N2 and it is suggested that better coordination between resource managers through a central body be instituted. It is agreed that both the crayfishers and the public at large need environmental education and that more research should be done to determine priorities in conservation. A central body governing marine resource management is the result anticipated from the KDNC and NPB amalgamation.

All respondents demonstrate support for the monitoring of *P. homarus* at Mfazazana but the present licence system is the point of debate between stakeholders. The crayfishers and the NPB demonstrate the most extreme views in future management of the resource while the other stakeholders fall more moderately between them.

The crayfishers want the present licence system removed, the sale of crayfish to be legalized and the community to continue monitoring. Their views are generally supported by the majority of the resident Forum members. It is significant that a majority of the crayfishers support their call for an end to the licence system with a perception that they are presently adhering to regulations despite evidence to the contrary; *P. homarus*' absolute food value to the crayfishers is paramount over concerns for the fitness of the animal. Therefore, a programme of environmental education which involves the long term sustainability of the species and why this is important would be of value at Mfazazana.

The KDNC, the NPB, the SAP and the non-resident Forum members support in differing degrees the maintenance of existing regulations as these pertain to *P. homarus*. The majority of KDNC, SAP and non-resident Forum members support the establishment of a formal crayfish market at Mfazazana with more community involvement in monitoring of the resource than demonstrated at present. The KDNC are particularly aware of the role of uncontrolled market forces on the potential depletion of *P. homarus*.

The NPB perceive very strongly the link between the present regulations pertaining to *P. homarus* and its sustainable management elsewhere on the coast. Thus changes in commercial access rights by the crayfishers at Mfazazana is not a point of negotiation for the NPB despite difficulties in managing the present system at Mfazazana. The NPB's concern to identify consumption levels of crayfish in crayfishers in order to determine user legitimacy has profound policy implications.

Changing relationships between stakeholders and P. homarus

The perception of change differed significantly across the stakeholders. The crayfishers and the majority of resident Forum members registered change in their access to the crayfishery through transitions in the political and economic contexts. The NPB and the KDNC identified change primarily in the socio-political and economic contexts of the locality, though biophysical change was indicated by both these stakeholders. The SAP perceive changes in the political context in a positive

light while negative changes were identified in the socio-economy of the region. The KDNC and the SAP perceive the link between economic downturns and natural resource depletion. The non-resident Forum members registered change in the socio-political context.

The Crayfishers

The crayfishers generally perceive change in the political and economic context of the locality which has altered their access to *P. homarus* at Mfazazana. Many indicate that their grandfathers had been better off since they had not been subject to the constraints of the regulatory system and others that a depressed economy has led to an increase in illegal harvesting of crayfish by people without licences. The framing of change as a function of shift in policy and economy is consistent with the crayfishers perception of self as poor, powerless and unemployed and dependent on the absolute material value of the resource which is registered as a change in access to the material value of the resource and thus to their income.

Overall, no discernible change is perceived by the crayfishers in terms of catch rates or the biophysical availability of the resource now or in the future. The fatalistic perception of plenty regulated by God and harvested in order to achieve greater personal autonomy indicates a lack of understanding of the potential of depletion in stocks due to the unregulated crayfishery. In contrast, a perception of zero change in catch rates may indicate that no change has occurred and that the depletion of *P.*

homarus stocks, as indicated by Schleyer's study (1991) for the ORI, is not easily discernible on the ground.

The Resource Managers

Resource managers register more diverse sites of change. Change is primarily registered by the KDNC respondents in the socio-political and economic contexts of the locality. A shift in political climate and more specifically in the site of power since the elections in 1994 is registered by all. It is perceived that power over marine resources has shifted from White hands into Black hands; where Black people were once viewed as stealing from White people, natural resources are now perceived by Black people to be free. The perception that the demand for *P. homarus* is a result of the 1994 election and unemployment levels since the elections put an increased pressure on natural resources indicates a perception that political changes produce economic ones. A minority of KDNC respondents indicate a long standing depletion of the physical environment.

Changes on a socio-political level which are perceived in terms of shifts in relations between race groups, is consistent with the succession of a dominant White apartheid government to a more democratic Black government. The apartheid system had limited Black access to resources to the homelands, and the new political dispensation has delimited access to natural resources without

implementing the corresponding changes to regulatory structures. The link between political and economic change may be understood as a perception of the link between human development and natural resource depletion.

The NPB respondents registered change in the socio-political and economic as well as in the managerial and biophysical contexts relating to crayfish harvesting at Mfazazana. Social change dominated the perceptions of NPB officials with a primary focus on change in the equality of access to natural resources which coincides with that registered by the KDNC. A more liberated society combined with a new disregard for the law by the public at large was cited as a reason for increased illegal use of natural resources since the elections and democracy. The society is perceived to have become greedy and more arrogant in its demand for natural resources as jails become correspondingly more overcrowded and community services fewer.

Biophysical changes are indicated following an informal count of crayfish available for sale on the N2 by one NPB official who suspects that bag limits are not being reached by crayfishers at Mfazazana, which would indicate a decline in stocks. Without reading the biological stock surveys it is indicated that no change in stock levels would be perceived at ground level. While establishing whether bag limits are being achieved is beyond the scope of this study, the suggestion that declines in catch rates are not discernible at ground level supports the perception of the crayfishers who deny that any decline in the availability of the resource exists.

Identified by the NPB is a new set of relations between conservation and community which is consistent with the changing functions of an amalgamated conservation agency operating in the province during the period of transition. Residents of Mfazazana constitute a new set of players in resource management who are perceived to be in need of being taught the necessity of natural resource regulation by the NPB. The trend of compliance in other communities long under NPB jurisdiction supports this perception by NPB respondents.

This new set of relations appears to be the result of a move away from a highly authoritarian government under apartheid, which divided law enforcement from community participation, to the new democratic dispensation which aims to be more holistic in its management of natural resources. However, new environmental management initiatives are still couched in the vocabulary of law enforcement which continues to dominate the language of the NPB respondents. As long as compliance is perceived to be of benefit only to the community, relations between resource managers and communities were likely to remain based in an unequal divide of power.

The SAP respondents register change in the political and socio-economic contexts of the locality since the 1994 elections. Changes in the political context are perceived in a positive light while changes in the socio-economic situation are perceived to be negative; changes in both these contexts are interpreted in a racial light. More outsiders from Durban and Gauteng are perceived to be harvesting illegally as affirmative action has driven more unemployed White men to turn to

marine resources as a source of income. Illegal crayfish harvesting is identified as a 15 year old problem which is indicative of chronic conflict over several years regardless of exact time periods. As in the case of the KDNC, SAP respondents link a perceived decrease in economic opportunity since the elections to natural resource depletion.

The SAP respondents indicated that they know communities better since becoming more interactive. As opposed to the NPB, the SAP view their improved relations with local communities as a benefit to their organisation and to the communities themselves which may be reflected in the decreased level of conflict between the SAP and these communities. Overall the greater interaction of the SAP with local communities in a more democratic climate appears to be giving the SAP a greater sense of control in the administration of their duties. The local population is perceived to be fixed after an increase in settlement over the last 20 years of unrest when Mfazazana provided open space closer to regional work opportunities.

Resident Forum members perceive an improvement in relations between the resource managers and the community since the advent of the Fishing Forums in the form of better treatment of communities by resource managers. Resident Forum members register no change in illegal harvesting or catch rates since their forefathers fished, consequently fishing is perceived to have been better before the regulation of *P. homarus*.

the individuals in that society as the new political dispensation has yet to acquire the attachment, commitment, involvement and belief in the new government.

Change is registered along two basic lines amongst the stakeholders. Overall the crayfishers and the majority of the resident Forum members register change in their access to marine resources through changes in policy. Other stakeholders generally perceive change in the socio-political context and the economy linked to the changing face of government since the 1994 election which for some is perceived in racial terms. Socio-political change is identified in the public as apathy, lawlessness, greed and arrogance regarding natural resources. Though the KDNC and the SAP make direct links between the changing economy and natural resource depletion, few respondents indicate specific areas of depletion. Changing relations between resource managers and the community are perceived by the SAP, the NPB and the Resident Forum members; only the SAP indicate that both parties benefit.

Conclusion

The results of the five areas of enquiry indicate that the stakeholders involved with the marine resource *P. homarus* at Mfazazana hold conflicting environmental perceptions of the resource which is producing a conflict over its sustainable management. An examination of perceptions of relative value reveal that the resource is valued differently by different stakeholders. An understanding of the link between the respondent's relationship to *P. homarus* and the corresponding

perception of how *P. homarus* should be managed at Mfazazana supports the notion that the respondent's access to biophysical, socio-economic and political resources determines their treatment of the natural resource.

When the stakeholder perceptions were compared to those suggested by O'Riordan (1989) the resulting perceptual differences between stakeholder groupings were linked to differences in human development and relative and absolute power as discussed in the conceptual framework. Thus differential access to biophysical, socio-economic and political resources has produced correspondingly different expressions of marine resource management and conflict across the stakeholders. The crayfishers hold conflicting values of the same resource in terms of a relative systemic or ecocentric value and a utilitarian or technocentric absolute value where the absolute value predominates in times of economic need. Thus, the crayfishers generally have a utilitarian view of *P. homarus*, in terms of the financial value of the resource, but a relatively communal view of its management, in terms of the increased role they wish community to play in management. The NPB also hold conflicting values of the same resource as responsibility to licensees and to law enforcement highlights the technocentric view of management of the resource, while their desire to protect biodiversity and their recognition of the right of crayfish to survive as a species reflects the ecocentric value of *P. homarus* to the organisation. The KDNC is generally found to hold an ecocentric view of the resource as their responsibility does not extend to law enforcement or management of the resource. The SAP, non-resident Forum members and one resident Forum member generally see the resource as being both technocentrically utilitarian and ecocentrically

important to the natural system while the majority of resident Forum members value the resource in strictly technocentric terms (O'Riordan, 1989).

The crayfishers and the NPB are the stakeholders engaged in the most intense conflict over the management of *P. homarus* as the crayfishers' income needs clash with the NPB's law enforcement responsibility. As the NPB's stereotyped perception of the young, delinquent crayfisher pervades the perception of the crayfishers by the other stakeholders, it may be concluded that the NPB holds the greatest power in the conflict. The place in which this conflict between income and responsibility takes place, has determined the stereotype of the weaker opponent, rather than identifying the real threat to *P. homarus*, which is in fact the middle aged Mfazazana crayfisher who contravenes the legislation so as to satisfy the demand for the marine resource in local homes, hotels and restaurants.

An examination of the power relations operating between stakeholders at Mfazazana reveals a hierarchy of power within which stakeholders have different access to the biophysical, socio-economic and political resources of the locality based on their relative position in the hierarchy. The NPB hold the greatest power over the resource. This is indicated by the wide dissemination of the NPB stereotype of the crayfishers and of the problem to the other stakeholders which demonstrates the exclusive power held by the NPB in determining the nature of the problem of illegal crayfishing at Mfazazana. The crayfishers occupy the lowest position in this hierarchy as demonstrated by the extremely localised dissemination of the stereotype of the abusive resource managers and of the conflict over loss of income

which is maintained by their group and to a certain extent by the resident Forum members. The nature of this relationship between the resident Forum members and the crayfishers is by virtue of association and common experience of the locality, thus indicating the proximate position of these resident Forum members to the crayfishers in the hierarchy of power.

The position of the KDNC in the hierarchy may be understood as lying between the resident Forum members and the NPB as demonstrated by their weak conservation role, due to a lack of law enforcement powers, which is still strong enough to instil fear in crayfishers, who flee from KDNC officers on the N2. The SAP hold a similar position to the KDNC in terms of their power to search and seize which is de facto the jurisdiction of the NPB. The SAP's position, however, is not by virtue of political weakness but is rather a question of complementary jurisdictional power with the NPB over the resource. The non-resident Forum members are sufficiently removed from the conflict that their position in the hierarchy is difficult to determine but may be similar to the resident Forum members in terms of power to influence. The result of a disempowered stakeholder in this hierarchy is the inability of that stakeholder to change the nature of their relationship to the resources of the locality and thus to resolve the conflict in the sustainable management of *P. homarus* at Mfazazana.

Different levels of human development are also present amongst the stakeholders interviewed. The crayfishers experience both relative and absolute poverty which is perceived by them to justify the illegal harvesting and sale of *P. homarus* at Mfazazana. The crayfishers at Mfazazana hold a low position on the hierarchy of

power as indicated by a self-perception and stereotype of poverty and powerlessness, a lack of economic choice and an inability to satisfy primary needs and personal autonomy. This low position of power has resulted in an imbalance of interests and an imbalance of outcomes which has contributed to the crayfishers' disenfranchisement by society and allows them to deviate into depleting the natural environment.

Four stakeholder groups are instrumental in the unsustainable management of the resource at Mfazazana. The crayfishers contribute to the threat to the biological fitness of *P. homarus* in not consistently adhering to the regulations which have been demonstrated to guard the species against depletion. The resident Forum members contribute to this same threat to the resource in condoning the crayfishers' non-compliance with the present regulations. The KDNC contribute in not having implemented any environmental education initiatives at Mfazazana in terms of their mission statement (See Appendix 1a). The NPB fail to administer law enforcement with consistent efficiency on the N2 and elsewhere outside Mfazazana which is in breach of their mission statement (See Appendix 1b). Thus a weakened administration of existing legislation through political divide has been ineffectively implemented by those agencies formally and informally charged with the task of conserving the resource and unheeded by those whom it is meant to control.

Different positions within the hierarchies of power and human development are shown to be occupied by the different stakeholders. Thus the human impact on *P. homarus* at Mfazazana is the result of patterns of use and control by groups with

differential access to resources competing for the same marine resource, which undermines its sustainable management.

Chapter 6. CONCLUSION AND RECOMMENDATIONS

Conclusions

This research has addressed the issue of sustainable resource use through an examination of the perceptions of the various stakeholders who impact on *P. homarus* at Mfazazana, in southern KZN. The examination of the locality suggests that the interaction of the biophysical, socio-economic and political contexts of this locality, as these are contained in time and space, coincide with the action of human agents to produce a high level of conflict in the area. The nature of the risk to *P. homarus* comes from the particular current interaction of these factors rather than from any inherent biological property of the species itself. Therefore it is the intersection of the patterns of use, the existing legislation and socio-economic context which threatens the sustainability of *P. homarus* as a marine resource at Mfazazana.

The interactions of human activity in a place of high natural diversity combine to result in a fragile environment. The limited agricultural potential of the area puts correspondingly more pressure on the readily available marine resources at Mfazazana. *P. homarus* is fit as long as current regulations, especially those pertaining to the legal size, bag and closed season limits as well as females in berry, are adhered to.

The Perceivers	The Perceived: Cray Fishers	KDNC	NPB	SAP	RFM	NRFM	Crayfish	The Public	Present Regulations	Change
CRAY FISHERS	Poor and Powerless Supporting Family Selling in town	•	Abusive Powerful law enforcers	Abusive Law enforcers	•	•	Majority direct Historical relation-ship Material value	Neutral	Licence system removed Commercial status accorded at M Community Monitors	Change in access to *P. homarus* du to policy change
KDNC	Young Black Males Selling on the N2	Indirect role Extention and Education work Powerless to implement SD At odds with other stake holders	Responsible for protection of coastal zone	•	•	•	Indirect role Innate systemic value of Resource	More lawless, apathetic, and arrogant Ignorant of threat to *P. homarus*	Not effectively regulated Commercial status acorded to at M More Community involvement Illegal harvesting and sale will not stop	Socio-political and economic change since 1994
NPB	• Delinquent Youths Selling on N2 • Adult rod users not a problem	Separate mandates Do not work together because of apartheid legislation	Direct role Marine custodian Powerful over MR Powerless to enforce SD	•	•	•	Direct Role Marine custodian Power over resource Systemic & Utilitarian value	More lawless, apathetic and arrogant Ignorant of threat to *P. homarus*	Not effectively regulated Licence system stays No Commercial status accorded at M	Socio-political and economic change since 1994
SAP	Delinquent youths selling on N2	•	Act in conjunction with SAP Uphold marine law	Uphold law to protect MR and Communities Powerful in conjunction with NPB over MR	•	•	Indirect role Systemic & Utilitarian value	Supportive of SAP	Not effectively regulated Licence system stays Commercial status accorded at M More Community involvement Illegal harvesting and sale will not stop	Socio-political and economic change since 1994
RFM	• Adults Support families Sell in towns • Youths selling on N2	•	Abuse local crayfishers	Abuse local cray fishers	Role is to catch fish Responsibility and authority over the resource did not emerge	•	Indirect role Luxury food value	Use roads and MR against interests of commu-nity	Not effectively regulated Licence system removed Commercial status accorded at M More Community involvement	Change in access to *P. homarus* du to policy change
NRFM	• Delinquent youths Selling on N2 • Adults not a problem	•	•	•	•	Indirect role	Indirect role Systemic & Utilitarian value	More lawless, apathetic, and arrogant	Licence system stays Commercial status accorded at M More Community involvement	Socio-political and economic change since 1994
LC AND MRFM	• Youths selling on N2 • Adult rod users selling in towns	•	Positive view of the NPB	Positive view of the SAP	•	•	Direct role Systemic & Utilitarian value	Neutral	Licence system stays Commercial status accorded at M More Community involvement	Change in access to *homarus* due to poli change

- • Knowledge of this Group did not Emerge
- LC Licenced Crayfishers
- M Mfazazana
- MR Marine Resources
- MRFM Minority Resident Forum Member
- NRFM Non Resident Forum Members

of poverty and powerlessness, a lack of economic control and an inability to satisfy primary needs and personal autonomy.

The NPB occupy the highest position in the hierarchy of power over the resource and are in the greatest conflict with the crayfishers by virtue of directly conflicting interests over *P. homarus*. The crayfishers and the NPB hold the most conflicting notions of future management initiatives for the resource where the NPB wants existing regulations maintained and the crayfishers want the community to monitor and administer a legal commercial crayfishery. The conservation authorities' pessimism regarding sustainable development and the intrusion by conservation, perceived by crayfishers, of their activities, poses a threat to the successful implementation of sustainable development.

The following table illustrates the stakeholders perceptions of themselves, each other, *P. homarus*, future management initiatives and change in the locality and represents a summary of the research findings and of the conflict between the stakeholders over *P. homarus*. The table is laid out to expose the totality of the conflict through the perceptions of stakeholders in summary which gives the reader a quick view of the differences and commonalities of the perceptions.

The Perceivers	The Perceived										
		Cray Fishers	KDNC	NPB	SAP	RFM	NRFM	Crayfish	The Public	Present Regulations	Change
	CRAY FISHERS	Poor and Powerless Supporting Family Selling in town	•	Abusive Powerful law enforcers	Abusive Law enforcers	•	•	Majority direct Historical relation-ship Material value	Neutral	Licence system removed Commercial status accorded at M Community Monitors	Change in access to *P. homarus* du to policy change
	KDNC	Young Black Males Selling on the N2	Indirect role Edention and Education work Powerless to implement SD At odds with other stake holders	Responsible for protection of coastal zone	•	•	•	Indirect role Innate systemic value of Resource	More lawless, apathetic, and arrogant Ignorant of threat to *P. homarus*	Not effectively regulated Commercial status acorded to at M More Community involvement Illegal harvesting and sale will not stop	Socio-political and economic change since 1994
	NPB	• Delinquent Youths Selling on N2 • Adult rod users not a problem	Separate mandates Do not work together because of apartheid legislation	Direct role Marine custodian Powerful over MR Powerless to enforce SD	•	•	•	Direct Role Marine custodian Power over resource Systemic & Utilitarian value	More lawless, apathetic and arrogant Ignorant of threat to *P. homarus*	Not effectively regulated Licence system stays No Commercial status accorded at M	Socio-political and economic change since 1994
	SAP	Delinquent youths selling on N2	•	Act in conjunction with SAP Uphold marine law	Uphold law to protect MR and communities Powerful in conjunction with NPB over MR	•	•	Indirect role Systemic & Utilitarian value	Supportive of SAP	Not effectively regulated Licence system stays Commercial status accorded at M More Community involvement Illegal harvesting and sale will not stop	Socio-political and economic change since 1994
	RFM	• Adults Support families Sell in towns • Youths selling on N2	•	Abuse local crayfishers	Abuse local cray fishers	Role is to catch fish Responsibility and authority over the resource did not emerge	•	Indirect role Luxury food value	Use roads and MR against interests of commu-nity	Not effectively regulated Licence system removed Commercial status accorded at M More Community involvement	Change in access to *P. homarus* du to policy change
	NRFM	• Delinquent youths Selling on N2 • Adults not a problem	•	•	•	•	Indirect role	Indirect role Systemic & Utilitarian value	More lawless, apathetic, and arrogant	Licence system stays Commercial status accorded at M More Community involvement	Socio-political and economic change since 1994
	LC AND MRFM	• Youths selling on N2 • Adult rod users selling in towns	•	Positive view of the NPB	Positive view of the SAP	•	•	Direct role Systemic & Utilitarian value	Neutral	Licence system stays Commercial status accorded at M More Community involvement	Change in access to *homarus* due to poli change

• Knowledge of this Group did not Emerge
LC Licenced Crayfishers
M Mfazazana
MR Marine Resources
MRFM Minority Resident Forum Member

The actions of the NPB, the KDNC, the resident Forum members and the crayfishers show how agency is a contributing factor in the threat to the biological fitness of *P. homarus*. Both the NPB and the KDNC have contravened the terms of their mission statements (See Appendices 1a, 1b), the NPB in failing to provide consistent law enforcement to the areas adjacent to Mfazazana, the KDNC in neglecting their responsibility to provide environmental education to the residents of Mfazazana. The crayfishers' persistent violation of regulations in place to protect *P. homarus* is confirmed by the results of this study. The resident Forum members contribute to this same threat to the resource in condoning the crayfishers' non-compliance with the present regulations.

The NPB stereotype of the conflict is compounding the threat to *P. homarus* at Mfazazana. The NPB as the dominant authority structure, has successfully propagated the stereotype of the problem of illegal crayfish harvesting as a conflict over law enforcement with the crayfishers on the N2. Where the selling of crayfish on the N2 and capturing of crayfish outside Mfazazana is perceived as illegal, these activities when occurring in reverse at Mfazazana and in nearby towns, is accepted because it is condoned by the conservation authorities in the region. This acceptance on the part of conservation authorities is the result of the maladministration by the KDNC and the NPB of their respective responsibilities tasked to them by a divided and weak structure of administration. This research indicates that the majority of crayfish are not sold by the crayfishers on the N2 and thus the potential threat to the species occurs beyond the scope of the NPB's stereotype of the problem.

The lack of contact between the NPB and the crayfishers allows the respective NPB and crayfisher stereotypes to persist. This enables the NPB's narrow perception of self as law enforcers to remain and undermine the development of truly participative environmental education initiatives. The stereotyping of the NPB as abusers, and of themselves as poor and powerless, allows the crayfishers to avoid taking responsibility for their actions and to continue to justify their breach of the law by a fixed image of powerlessness and poverty. This fixed image on the part of the crayfishers may prevent them from harvesting *P. homarus* sustainably

The narrow definition of the conflict at Mfazazana contravenes the crayfishers' and the NPB's protection of *P. homarus* and their primary interests regarding the species. The NPB's perception of threat is not primarily to the resource under their authority but rather to the authority itself and to the licensees. The source of resource depletion is unknown to the NPB, and as such the crayfishers are not a threat to the resource so much as a threat to the primary interests of the NPB as law enforcers. In selling on the N2, the crayfishers challenge the authority which maintains the present licence system and which ensures partial adherence to the law by the licensees. Therefore the limiting of the conflict to the N2 indicates that the NPB act not as marine custodians so much as custodians of law enforcement. The narrow definition acts to jeopardise both their proposed protection of *P. homarus* and their primary protection of the rights of licensees in failing to recognise the market beyond the N2.

In defining the conflict as limited to the N2, the crayfishers betray their utilitarian interest in the crayfish. The available evidence that animals are not being thrown back and that closed season and size regulations are contravened, belie only a superficial adherence to the regulations. The crayfishers' primary interest in generating income through the capture and sale of *P. homarus* is infringed by the wanton capture of crayfish at Mfazazana and sale in nearby towns which the narrow definition of the conflict precludes. This wider market is a threat to the fitness of *P. homarus* at Mfazazana which in turn poses a threat to the sustainability of both the catch by licensees and to the generation of future income by the crayfishers.

The delinquent stereotype of the crayfisher at Mfazazana has far reaching impacts on the perception of the crayfisher by himself and by buyers of *P. homarus* which act to threaten the sustainability of the resource. Inconsistent contact though inconsistent regulation facilitates the construction of stereotypes. The delinquent stereotype reflects back an image to the crayfishers which facilitates the illegal harvest of *P. homarus* at Mfazazana through the disenfranchisement of the crayfisher. Inconsistent external control precludes the formation of strong links to society and of internal control in the crayfishers of their activities. This lack of internal control on the part of the crayfishers, coupled with low levels of human development, contribute to the formation of the fatalistic attitude regarding the management of the resource by the crayfishers and the majority of resident Forum members. The sustainable development paradigm calls for a sense of responsibility in the managers of *P. homarus* which is impeded by a fatalistic approach to resource management.

At Mfazazana the marine economy is in a spiral of decline due to the combined processes of luxurisation and undervaluation which is facilitated by the perception that the seller at Mfazazana occupies a low status. The NPB stereotype of the delinquent crayfisher promotes the perception of a low status individual and denies the reality of the middle aged individual who supports a family and does not spend all his earnings at the local shebeen. The stereotyped delinquent crayfisher is important in the perception of the buyers empowered by the powerlessness of the seller to determine the price paid for the resource. Where the price for the resource is kept down due to the low status of the seller, wider market forces determining the demand for luxury goods remains high. The lower the status of the crayfisher in the perception of the buyer, the higher the likelihood of resource exploitation through combined undervaluation and luxurisation.

The economic discrepancy between Mfazazana and neighbouring communities (See Figure 3.2) remains an incentive for the illegal trade in *P. homarus* between Mfazazana and those communities. An exchange between the affluent buyer and the impoverished seller of money for status through the luxury item seems inevitable between the two. The incentive is spurred on by the deprived conditions in which the Mfazazana crayfisher lives. The economic conditions of the market in undervalued luxury commodities encourages the Mfazazana crayfishers to participate in the trade which puts the resource at biological risk. The same economic conditions which undervalue resources through the poverty of the seller, promote through luxurisation, the contravention of regulations which protect these resources.

The patterns of differentiated consumption of the resource at Mfazazana based on status, gender and historical access may allow the issue of illegal crayfish harvesting at Mfazazana beach to be 'hidden' from both the community and the resource managers and allow focus to be maintained on the N2. The resource managers are ignorant of these patterns of consumption and as such are ignorant that contraventions are occurring in the community at Mfazazana. The powerless position of the resident Forum members in the conflict allows these contraventions to continue. These patterns of consumption may also contribute to the perception by crayfishers that selling to private residents, restaurants and hotels outside Mfazazana is acceptable as customers of similar standing exist at Mfazazana. The focus away from the illegal capture at Mfazazana beach and the trade beyond the N2 by authority structures in the region has contributed to the threat to *P. homarus* at Mfazazana.

The lack of community responsibility for the sustainable management of *P. homarus* may also be the result of community ignorance regarding the threat to *P. homarus* in biological surveys. As indicated by NPB respondents, signs of depletion in *P. homarus* at Mfazazana are difficult to discern without having read the biological surveys indicating a decline in catch rates. The majority of resident Forum members have not had any contact with information indicating a decline in *P. homarus* catch rates, which questions how efficiently this information is being disseminated by conservation authorities to community forums. The ignorance on the part of the public, the local TLCs and magistrates as a contributing factor in the continued illegal capture and sale of *P. homarus* at Mfazazana, also puts into question the

effective transfer of information to communities outside Mfazazana. A lack of knowledge amongst community members facilitates their irresponsible attitude to crayfish harvesting.

Draft proposals for the recognition of different user groups perceive the crayfishers at Mfazazana to be motivated by financial satisfaction and the artisanal crayfisher by survival (van der Elst, 1996). The income production and increased human choice of human development is the goal of crayfishers at Mfazazana through the capture and sale of the resource. Thus promoting human development and autonomy promotes sustainable resource use. Therefore the exclusion of the crayfisher at Mfazazana from the proposed legislation as a user group, contravenes the dictates of the sustainable development paradigm. In addition, it is suggested that the government is not working within the paradigm that conceives people as an integral part of the environment in that it is responding to human needs such as food and water without including people's relationship with the environment as a basic need (Environmental Justice Network Forum, 1994). Thus sustainable development may have become overloaded and confused with little agreement as to what it actually means. If this is the case then it appears that government officials need environmental education as urgently as the communities they purport to serve.

Recommendations

The following recommendations are the result of this research and aim to facilitate the resolution of the conflict over *P. homarus* at Mfazazana. Final reccommendations in point form may be found in Appendix 5. Establishing a co-management structure between conservation authorities and the community at Mfazazana is necessary in ensuring the sustainable management of the resource as well as in developing models of sustainable management on the KZN south coast. A co-management structure involves the negotiated system of resource management which places the stakeholders in direct and equal relation to each other and to the resource in determining and implementing management objectives. In the case of *P. homarus* at Mfazazana, a first step in this process would be to facilitate contact between the NPB, the crayfishers and the other stakeholders identified in this research. Following an initial meeting, an itinerary of meetings would be set up to discuss the objectives of each of the stakeholders in order to arrive at a negotiated settlement.

Management by negotiated settlement is favoured, as opposed to imposed systems which are breached by stakeholders unwilling or unable to maintain a position within the system and so act outside it as in the case over *P. homarus* at Mfazazana. Issues of conflict resolution and capacity building need to be addressed in the restructuring of the management process for crayfish at Mfazazana. This will demand a great deal of commitment from the stakeholders over a period of years. The process of setting up co-management systems needs to be seen as a fluid and dynamic process and the anticipated result may be quite different from the end

reality. Policy issues are likely to arise at Mfazazana and stakeholders should be flexible while not loosing sight of the end goal which is to find a way of sustainably managing the resource. The depth of knowledge garnered from Mfazazana makes it important that a co-management system be set up to resolve this conflict. As so few examples of sustainable systems of co-management exist between communities and conservation authorities, this case study at Mfazazana could play a role in providing guidance for resolving other conflicts over resource management elsewhere in the future.

Micro-tourism may be a way of breaching the conflict between the development needs of the crayfishers, the market needs of the buyers and the dictates of the natural environment. An estimated daily catch by crayfishers at Mfazazana would have to be ascertained, however given the suspicion by NPB officials that bag limits are in fact not being reached, a restaurant rather than a market may be a better option. The restaurant would be run by an entrepreneur identified from the community at Mfazazana who would be assisted through government subsidy and advice regarding the management of a small business. Local crayfishers would be accorded special status to catch and sell crayfish legally, based on their identification as resident crayfishers with crayfishing as their primary occupation.

These crayfishers would undergo environmental education as a condition of their special status and they would have to adhere to the regulations as they stand in order to qualify as licensed commercial crayfishers. Crayfishers accorded this special status would be required to monitor catch rates and any licensed crayfisher

caught violating regulations would be summarily relieved of their special status and served the full measure of the law along with any other individual caught violating it. The legalisation of commercial crayfishing of *P. homarus* would be confined to Mfazazana and further confined to those crayfishers who comply with the conditions of their licence. Examples such as Steve's Restaurant on Lake Malawi provide incentive to use Mfazazana as a test model for future ventures in ecotourism (Roberts, 01/10/96).

Kiepiel and Quinlan (1995), indicate the potential importance of micro-tourism as a means to integrated development planning. Marine life was being heavily exploited along the 'Wild Coast' due partly to the low value and relative insignificance which the local communities attributed to these marine organisms. Where micro-tourism can not singly solve economic and conservation problems in a region, it can promote diversification of economic activities to the benefit of the local population. In addition, micro-tourism is identified as a useful means to promote localised, participatory management of marine resources on the ground and a style of management which serves well conservation and development aspirations (Kiepiel and Quinlan, 1995).

According status to the crayfisher both in terms of a specialized commercial licence and employing resident Mfazazana stock monitors would be instrumental in relinking the crayfishers with their community. Environmental education which focuses on the human impacts on the natural environment of the crayfishers should be implemented together with the environmental education of Tribal Authorities, magistrates and TLCs as well as the public at large. Pivotal in the dissemination of environmental

information is the fostering of the notion of individual responsibility for common resource use.

Changing the balance of power between the resource managers and the crayfishers by increasing contact between these two groups as well as making these contacts less racially, linguistically and sexually distinct is important. By employing more 'African' , Zulu speaking women to provide environmental education and to disseminate environmental information, the stereotypes maintained by the stakeholders in conflict are likely to be broken down. This breaking down of stereotypes will change the quality of the relationships which have caused the conflict over *P. homarus* at Mfazazana.

Discussions of different levels of power in this thesis in no way suggests that the power accorded to conservation authorities such as the NPB and the KDNC be usurped by communities. The power and responsibility to oversee resource management is important and needs to be placed in agencies beyond the community. Therefore, where this thesis identifies areas of resource mismanagement by the NPB and the KDNC, this in no way means that they should be relieved of their power. To the contrary, the powers of conservation authorities should be strengthened to allow them the security of purpose to initiate and maintain participatory systems of resource management with communities.

More coordinated regional protection of *P. homarus* across provincial boundaries would provide that species with better and more appropriate protection. Towards this

end, better communication between resource managers is indicated in terms of providing the best management of the resource most efficiently. The imminent amalgamation of the NPB and the KDNC is expected to improve the respected strengths of each organisation greatly through a coordinated unification of environmental education and law enforcement across the entire province of KwaZulu-Natal for the first time.

Issues of community representation need to be addressed if the dictates of the sustainable development paradigm are to be adhered to. As demonstrated by this study, stakeholders in various position of power and authority determine whether a resource is sustainably managed or not. Thus in accessing only the Amakosi and the resource managers involved in a conflict over natural resource use, the perceptions of other stakeholders are left unregistered to the detriment of the sustainable management of that resource. Accessing the inappropriate or incomplete range of stakeholders in a conflict such as this one results in the inefficient use of resources and the potential failure of the management programme.

Other recommendations include biological considerations. The ORI study (1991) showed that inshore breeding stocks at Mfazazana could not withstand the current fishing pressure as the population was being reduced through the removal of undersized animals. This raises the question of the feasibility of opening the rock lobster fishery to commercial use, as the extent to which this fishery could rely on offshore recruitment is unknown. A more comprehensive monitoring programme on the state of the rock lobster fishery by crayfishers and resource managers would

better determine Catch Per Unit Effort and thus determine how much fishing pressure the inshore stocks can take. The implementation of upper and lower size limits in terms of the elevated breeding potential of older and larger animals may provide an additional safety valve to the sustainability of *P. homarus.* The Transkei regulation which disallows daily accumulated bag limits would also serve to better protect *P. homarus* in KwaZulu-Natal. A survey of all users of marine resources, whether legally recognised or not, is imperative if responsible environmental planning is to take place within the dictates of the sustainable development paradigm.

Finally, the economic discrepancies and absolute poverty present in the study area and its surrounds will have to be addressed if the natural environment is to be protected. Better access to facilities would contribute towards the resolution of the illegal harvest of marine resources. Economic opportunities in the form of alternative job and small business creation will have to be a priority of government at all levels and the responsibility of all communities to facilitate. Whether it be in terms of income or choice, the natural environment cannot afford human poverty.

From the start this research has attempted to understand the perceptions of difference which may be at the root of the conflict experienced at Mfazazana. It is as if appropriate behaviours, thoughts and degrees of autonomy are granted acceptance according to constructed categories of age, gender, race, ethnicity, class, and power. This means that there is necessarily an interest in the ways in which the boundaries between these categories are formed in individual perceptions

as well as in the ways in which they are transgressed subverted and maintained. The idea being that should the mechanisms which create these boundaries somehow be altered, then the resulting repressions could also be altered (Shurmer-Smith and Hannam, 1994).

The research findings demonstrate that the interaction of the biophysical, socio-economic and political contexts of this locality and the action of human agents in relation to the resource have produced a high level of conflict at Mfazazana. Ultimately the way forward means consistent and judicious enforcement of an appropriate system of law by conservation authorities sensitive to the needs of all communities under their jurisdiction who are in turn sensitive to the needs of the physical environment.

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APPENDICES

APPENDIX 1A

Mission Statement

THE MISSION OF THE DEPARTMENT OF NATURE CONSERVATION IS TO PROMOTE THE INTEGRITY OF THE NATURAL ENVIRONMENT OF KWAZULU - NATAL.

The Department of Nature Conservation recognises the fundamental interaction of people, resources and the environment. The Department is particularly aware and concerned about the threats to the environment contained in the increasing pressures being placed on it due to rural poverty, unsustainable population growth and insufficient responsibility and accountability for the integrity of the environment.

In order to try and reduce this pressure the Department strives to make environmental integrity directly beneficial to the widest possible range of people. This is done through a management programme which, based on sound ecological principles, allows for the wise and sustainable use of the resources of that environment.

Furthermore, recognising the link between rural poverty, and environmental degradation the Department will support and encourage environmentally appropriate socio-economic development.

DEPARTMENT OF NATURE CONSERVATION
KWAZULU - NATAL

APPENDIX 1B

NATAL PARKS BOARD'S MISSION STATEMENT

The Natal Parks Board's vision is the long-term conservation of KwaZulu-Natal's natural resources in such a manner that the people of KwaZulu-Natal and of South Africa will benefit from and share in the diversity, economic value, and opportunities for spiritual well-being and recreation which they offer.

The Natal Parks Board's Mission is:

TO CONSERVE THE WILDLIFE RESOURCES OF KWAZULU-NATAL AND THE ECOSYSTEMS AND PROCESSES UPON WHICH THEY DEPEND, AND TO ASSIST ALL OTHER PUBLIC AND PRIVATE GROUPS IN ENSURING THE WISE USE OF THE BIOSPHERE.

Where:

- to conserve means to ensure the survival of indigenous fauna, flora and natural ecosystems, the promotion of public environmental awareness, and the provision of nature-orientated outdoor recreation;
- wise use signifies that which will maintain biological diversity and ensure sustainable utilisation of all resources;
- biosphere denotes that part of the Earth which sustains living organisms.

To achieve its mission, the Board must:

a) ensure that the diversity of life forms and biological processe Natal are maintained, within a network of Board administ protected areas and other areas which contribute to n conservation;

b) prevent the man-induced extinction of any species indigeno KwaZulu-Natal;

c) promote the utilization of wildlife resources in KwaZulu-Natal exercise control in order to ensure that all forms of utilizatio sustainable;

d) promote awareness of the functioning and importance of biosphere;

e) provide public access to protected areas and appropriate ser including opportunities for scientific study;

f) support KwaZulu-Natal's ecotourism industry by providing, self funding basis, visitor facilities and experiences which compatible with the Board's mission;

g) conduct its activities effectively and efficiently through pe dedicated to service and committed to nature conservation.

NPB Comms November 1994

APPENDIX 2

COMPARATIVE SOCIO-ECONOMIC DATA FOR THE DISTRICTS OF FORMER KWAZULU 1992

	Umzumbe	Ezingolweni		Vulamehlo	Average
		Rural	Urban		
*Average HH Income	R526.40	R633.80	R1808.30	R871.70	R859.60
Derived from (%):					
Remittances	25.0	16.3	3.1	14.8	10.9
Pensions and Transfers	24.8	19.0	4.2	23.3	13.8
Wages	46.0	63.4	91.6	60.7	73.7
Other	4.2	1.3	1.1	1.2	1.6
Average HH Expenditure	R466.90	R687.70	R1795.90	R719.60	R719.80
Spent on (%):					
Food	52.7	45.9	26.1	41.7	36.3
Electricity	0.2	0.9	5.3	1.9	3.2
Other Energy Sources	16.9	9.1	2.7	6.5	6.4
Water	0.0	0.1	0.6	0.0	0.3
Transport	3.3	4.1	3.9	3.1	3.7
Medical	1.2	1.1	1.1	0.9	1.1
Education	2.6	2.4	3.5	1.9	2.9
Credit Accounts	4.9	8.8	28.4	22.5	20.6
Other	18.1	27.7	28.4	21.3	25.6
Income Less Expenditure	R59.90	-R53.90	R12.40	R152.10	R139.80
Agricultural Activities					
Households with (%):					
➢1 ha of Land	28.7	19.6	0.9	15.0	18.3
A Garden Plot	47.0	32.0	1.9	27.0	30.6
Livestock	22.8	11.3	0.0	10.0	13.2
Poultry	33.2	33.0	1.9	39.0	27.6
Informal Activities					
HHs with Income from (%):					
Agricultural Production	0.5	0.0	0.0	0.0	0.2
Retail	4.5	7.2	7.4	5.0	5.7
Light Manufacturing	2.5	5.2	2.8	3.0	3.2
Transport	1.0	0.0	1.9	2.0	1.2
Other Activities	5.0	2.1	0.9	3.0	3.2

Urban-Econ: June 1996

* HH stands for Household.

2. Your perception of the role, responsibility and relationship of the 'other' to *P. homarus*.

- Who other than yourself is involved with *P. homarus* at Mfazazana ie: in terms of catching, selling, eating and monitoring or resource management
- Who catches *P. homarus* at Mfazazana/Turton
- Who does not
- Who buys *P. homarus* from M/T
- Who does not
- Who sells *P. homarus*
- Who does not
- Who eats *P. homarus*
- Who does not
- How do you come to know this information

3. Your perception of regulation regarding *P. homarus*

- Is there any
- If so what is it now
- How does it work
- What is the regulation set out to do, why is it there
- Is it effective in doing what it sets out to do
- Does *P. homarus* need to be regulated

- If so or If not why
- Are stocks being monitored now
- Do they need to be monitored
- Who regulates *P. homarus*
- Why them
- Who should regulate *P. homarus*
- Who is *P. homarus* being regulated for
- Are there differences in regulations between the conservation -organisations
- How do you come to know this information

4. What should be done re: *P. homarus*

- Is there a problem re: *P. homarus*
- If so what is it
- if so what should be done about it
- Can anything, should anything be changed in terms of the regulation
- If there is no problem now will there be one in the future... how soon
- Who should do what if there is a problem
- Should other people be involved who are not already involved
- Who and why
- Do we need to control, do we have benchmarks, do we need benchmarks in order to control

5. Has anything changed re: *P. homarus*

- How long have you had a relationship to *P. homarus*
- Is the catch better this year than last year, is it worse
- If there is a change how long ago did this change start
- What has changed (size, number caught, number of fishers)
- Has policy/regulation changed... have the rules always been the same
- Was the attitude of the 'other' always the same as it is now
- If not how and what has changed
- Is there more poaching now, less, different poaching problem (size vs female in berry)
- Has your relationship to *P. homarus* changed
- If so how

INTERVIEWS

Anonymous	(09/96)	Spokesperson KwaZulu Department of Nature Conservation
Roberts, A.	(01/10/96)	Principal Nature Conservator Tourism Development Officer KwaZulu Department of Nature Conservation
Kay, C.	(14/10/96)	Principal Nature Conservation Scientist KwaZulu Department of Nature Conservation
Millar, A.	(13/09/96)	Umtentwini District Conservation Officer Member of Community Policing Forum Member of south coast Fishing Forum NPB
Beatie, C.	(24/09/96)	Officer in Charge of Mpenjati Nature Reserve Officer in Charge of Trafalgar Marine Reserve Trafalgar District Conservation Officer NPB
Broker, R.	(01/10/96)	Conservator South Coast NPB

Mtaka, M.	(09/10/96)	Chairman for Rock Features South Coast Fishing Forum
Storm, J.	(24/09/96)	Chairman of the Umtamvuna Marine Conservancy Conservancies Representative South Coast Fishing Forum
Diener, V.	(12/09/96)	Owner of Engen Petrol Station at Hibberdene Member of Hibberdene Tourism and Publicity Association
*De Beer, J.A.	(12/09/96)	Captain in South African Police Member of Hibberdene Tourism and Publicity Association
*Van Rooyen, A.L.	(12/09/96)	Sergeant in South African Police Interested and Affected Party
Rautenbach, M.	(12/09/96)	Captain in South African Police Hibberdene Police Station Commissioner Member of Community Policing Forum

**Cele, N.	(10/09/96)	Resident Sports Fisherman Member of Community Policing Forum
**Mkhanyawo, T.	(10/09/96)	Resident Sports Fisherman and Member of Mfazazana Community Development Forum
**Maphumulo, G.	(10/09/96)	Resident and Member of Mfazazana Community Development Forum
***1	(16/09/96)	Crayfish Harvester
***2	(16/09/96)	Crayfish Harvester
***3	(16/09/96)	Crayfish Harvester
***4	(16/09/96)	Crayfish Harvester
***5	(16/09/96)	Crayfish Harvester
6	(16/09/96)	Crayfish Harvester
7	(17/09/96)	Crayfish Harvester
8	(19/09/96)	Crayfish Harvester
9	(19/09/96)	Crayfish Harvester
10	(25/09/96)	Crayfish Harvester
11	(25/09/96)	Crayfish Harvester
****12	(30/09/96)	Crayfish Harvester
****13	(30/09/96)	Crayfish Harvester
14	(13/10/96)	Crayfish Harvester
15	(14/10/96)	Crayfish Harvester

16	(15/10/96)	Crayfish Harvester
17	(16/10/96)	Crayfish Harvester
18	(17/10/96)	Crayfish Harvester

* These two individuals were interviewed together

** These three individuals were interviewed together

*** These five individuals were interviewed together

**** These two individuals were interviewed together

PERSONAL COMMUNICATIONS

Rassenyalo, J.	(05/08/96)	Chair of Community Policing Forum Mfazazana	
KDNC Meeting	(06/08/96)	E. Cele	Dept. of Economic Affairs and Tourism
		J. Rich	UNP
		A. de Leeuw	KDNC
		C. Kay	KDNC
		A. Roberts	KDNC
		P. Beuchel	NPB
		J. Harris	NPB
		A. Millar	NPB
		W. Munger	NPB
Colvin, P.	(07/08/96)	Master of biology Original Researcher in INR Study (1992) Resident of Pietermaritzburg	
Tsawulwayo, G.	(09/08/96)	Zulu/English Interpreter and Translator Resident of Betania, south coast KZN	

Fielding, P.	(12/08/96)	Doctor of Marine Biology	
		Oceanographic Research Institute	
		Durban	
Millar, A.	(27/08/96)	Umtentwini District Conservation Officer	
		Member of Community Policing Forum	
		Member of south coast Fishing Forum	
		NPB	
Community Policing Forum Meeting	(16/09/96)	included:	
		V. Deiner	Hibberdene Community
		C. Kay	KDNC
		D. Komo	Mfazazana Community
		J. Rassenyalo	Chair of Meeting
		M. Rautenbach	SAP
		J. Rich	UNP
Quinlan, T.	(12/11/96)	Doctor of Social Anthropology	
		Institute for Social and Economic Research	
		University of Durban-Westville	
		Durban	

Pope, K.	(19/11/96)	Agricultural Extension Officer Stationed at Port Shepstone Department of Agriculture
Butler, M.	(25/11/96)	Senior Researcher Community Agency for Social Enquiry (CASE) Pietermaritzburg
Spokesperson	(02/04/97)	Urban-Econ Durban Office

APPENDIX 4

Quantitative Description of the Crayfishers Interviewed

Identification	Age	Licence	Method	Catch Style	Sell Style	Point of Sale
1	35	no	poller	group	alone	N2
2	31	no	poller	group	alone	N2
3	21	no	poller	group	alone	N2
4	27	no	poller	group	alone	N2
5	70	no	poller	group	alone	Town
6	17	no	diver	group	alone	N2
7	43	yes	poller	group	alone	Town
8	42	no	poller	group	group	Town
9	37	no	poller	group	alone	Town
10	35	no	both	alone	alone	Town
11	35	no	poller	alone	alone	Town
12	46	no	diver	group	alone	Town
13	43	no	diver	group	alone	Town
14	35	yes	poller	alone	alone	Town
15	30	no	poller	group	alone	Town
16	26	no	poller	group	group	Town
17	42	no	poller	alone	alone	Town
18	35	no	poller	group	alone	Town

APPENDIX 5

FINAL RECOMMENDATIONS

The following summary of recommendations is the outcome of combining the qualitative and quantitative findings of the research in order to promote the sustainable management of *P. homarus* at Mfazazana.

- Educate all users and people in positions to affect the management of those people and resources on the impact of human development on the natural environment
- Develop successful models for sustainable development such as those offered by eco-tourism and co-management structures
- Improve the organisation and communication between conservation and other authorities involved in natural resource management
- Strengthen the powers of conservation authorities to oversee resource management
- Equalize law enforcement across time and space
- Equalize species protection across provincial boundaries and investigate the appropriateness of present regulations in terms of size and accumulated daily limits
- Always identify all the stakeholders involved with resource management and the history of their involvement
- Get the stakeholders to interact and break down their stereotypes of each other

- Change the balance of power to make it less racially, linguistically and sexually biased
- Foster the notion of individual responsibility for community resource use
- Accord status to the community and its members for the responsibility of the natural resources in their area
- Address the issue of economic inequality and human underdevelopment both in terms of income and choice
- Monitor more comprehensively *P. homarus* stocks along the KZN coast
- Survey all users of marine resources on the southern KZN coast in terms of appropriate planning and management of people and natural resources