MARINE TOURISM AND SHARKS:

A CASE STUDY OF PROTEA BANKS

by

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ABSTRACT

Marine tourism is an expanding segment of both international and domestic tourism in KwaZulu-Natal and can be of valuable contribution to the national and local economy, but there are also concerns about its sustainability.

Two of the most popular marine activities in KwaZulu-Natal are diving and recreational fishing. However, these two different user groups can also create conflicts as they have very different user practices in relation to the same marine area and its resources. While certain marine regions along the coast have been declared marine protected areas with site specific management plans, other popular marine areas remain almost unmanaged.

Shelly Beach on the South Coast of KwaZulu-Natal is the most popular boat launching site on the Natal coastline with both divers and recreational fishermen visiting a fossilised sand dune reef called Protea Banks which is situated 7 to 8 km off-shore from Shelly Beach. The reef is famous for its abundance of fish as the attraction for fishermen and big sharks attracting divers. A controversial topic in association with Protea Banks is its shark population. The divers are concerned that the number of sharks is decreasing, while the fishermen are concerned about there being too many sharks eating their hooked fish before they can boat their catch.

This study looks at marine tourism and sharks using Protea Banks as a case study for marine tourism and management. The focus is on stakeholders' and different marine user groups' opinions on management, marine resource protection and user conflict. The issue of sharks and sustainability in association with both diving and recreational fishing is also investigated.

The study shows that the stakeholders have developed a system of self-regulation based on the experience gained from their utilisation of Protea Banks. The stakeholders prefer to maintain this system rather than the authorities declaring the area a marine protected area or in other ways further involve the authorities. The various stakeholders express

different but specific environmental concerns including carrying capacity, seasonality and unsustainable pressure during the peak tourist season, shark and fish management, and lack of enforcement of regulations. The study concludes with recommendations towards a site specific management plan for Protea Banks.

DECLARATION

I declare that the work submitted in this thesis is all my own, except where specifically indicated in the text, that all sources have been acknowledged and referenced in the text, and that this work has not previously been submitted, either in whole or part to any other University degree purposes.

Signed: Gina Sjursæther Date: 5/9-2006

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1. INTRODUCTION

Coastal zones make up approximately 20% of the world's total surface, with 50% of the population living within 200km of the coast (Editorial, 2003). Additionally, the demand (and supply) for marine tourism and coastal recreational activities is increasing world wide. Marine tourism includes a range of activities from sunbathing to water sports such as surfing, fishing, snorkelling and SCUBA diving (Orams, 1999).

The sustainability of marine tourism is a controversial issue (Orams, 1999). Marine tourism is often regarded as a tool which can be used for economic development and financial generation in a specific area. However, tourism, including ecotourism or low impact tourism, can also result in negative and often cumulative effects. Management strategies for marine tourism development often run parallel to conservation and the establishment of marine protected areas (MPA) for the purpose of maintaining biodiversity and to preserve threatened species or ecosystems. MPAs are common in association with marine ecotourism (Hall, 2001).

In marine areas with different user groups with differing interests there is frequently conflict between the various groups. This problem might be particularly evident in MPAs where specific conditions of use and regulations apply, thus limiting some of the previous and traditional uses of the area. Involvement of stakeholders in decision making in the development of marine management plans is imperative for the plan's success, future functionality and acceptance (Lewis, 1996).

In order for sustainable tourism management strategies to be effective, there has to be a balance between financial income, use, and management in order to minimise negative environmental impacts. Management strategies include legislation, licences and permits, interpretation, fees and pricing, public-private collaborations and monitoring and evaluation. These strategies are especially important for ecotourism or sustainable tourism. Some of the problems that have emerged in many situations are that the economic expectations of ecotourism are too high, a lack of coordination, and the fact

that the attraction of (marine) ecotourism very often lies in the actual *lack* of much commercial development, with more aspects of natural and pristine tourism areas (Hall, 2001).

Global policies on coastal tourism include emphases on clean water and air, healthy ecosystems and sound policies for wildlife and habitat protection (NOAA, 1998 in Hall, 2001). Direct and indirect stakeholders play a crucial role in site specific decision making and development. Stakeholders include research and scientific institutions, the relevant authorities for the particular marine area and all the interested and affected parties. For the purpose of a marine site specific management plan development, it is imperative to consult direct stakeholders and user groups in order to produce fair management strategies through a transparent process. Additionally, the direct users of a specific resource usually have abundant knowledge concerning that particular ecosystem, knowledge which could prove invaluable to the successful development of the management plan (Lewis, 1996).

The topic of marine tourism and the presence of sharks in South African waters has been a notorious issue since the middle of the last century, and is still a topic which a range of marine user groups disagree upon. The general view on sharks has changed over time, but there are differing opinions of various stakeholders regarding how to manage these marine animals and apex predators.

Sharks are considered by dive tourists as an attraction, but as a threat for instance for beach tourism. Sharks have in many cases been a fascinating target for fishermen, but also an annoyance and competition for catching other fish.

Shark management on the subject of marine tourism is usually associated with shark nets and other anti-shark measures. However, there is a growing concern among scientists and divers concerning a decrease in the frequency and abundance of sharks and the general shark fishery management (Sharklife, 2005).

This study uses Protea Banks as a case study for marine tourism including stakeholders' opinions on management of tourism activities and the environment in which they take place. The main focus of the study is on environmental management of diving and recreational/charter fishing, but also shark management.

1.1. Sustainable development and sustainability

The principles and concepts of sustainable development can be seen as the mainstream approach within the environmental agenda today. Sustainable development is being used as the guideline for policies and business strategies on local, national, regional and global levels, with more or less overall success (Gibbs *et al.*, 1998).

The most common description of sustainable development is still the first official definition made by the Brundtland Commission in their report "Our Common Future" from 1987 (WCED, 1987 in Irwin, 2001, pp. 39):
"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

The term sustainable development is being replaced by that of sustainability, indicating more of a continuous process rather than a goal in itself (O'Riordan, 2000). Gibbs *et al.* (1998) discuss sustainability within a spectrum ranging from very weak, weak, strong to very strong sustainability. Weak sustainability is seen as typically techno-centric, focusing on economy rather than environment. Weak sustainability considers there to be a very close link between firstly, increase of financial capital and, secondly, decrease in environmental impacts. Weak sustainability includes the view that not much overall change is needed within institutions, society or business in order to achieve sustainability.

Weak sustainability is described as further empowering small elite of science experts, politicians and economists who in collaboration with each other encompass the majority of political power, as opposed to involving the public in decision making. The focus is on "the privileged and rich" Western nations and their economic goals, furthering the

distance of these from the less fortunate developing countries (Christoff, 1996 in Dryzek, 1997).

Strong sustainability has a more holistic approach, recognizing that a more complex change in society is needed in order to achieve sustainability. Resource and energy use needs to be minimised, and there will be limitations and constraints to evaluate strong sustainability as the resources are not finite (Gibbs *et al.*, 1998).

Strong sustainability is described as a broader and more democratic institutional change in society, involving citizens and all stakeholders in decision making. Strong sustainability strategies include openness to several potential correct solutions, with the adaptability of constant improvement through the inputs from all participants and stakeholders (Christoff, 1996 in Dryzek, 1997).

Wackernagel & Rees (1995) argue that the only real sustainability would be strong sustainability, and that a solution cannot always be found in technology. The earth's natural resources are finite and there will be a limit to its uses. The world population is growing, and so is the per capita consumption in general. A change in production, consumption patterns and lifestyle, especially in some industrialised countries, is needed in order to move closer to a more sustainable environment.

1.2. Tourism, sustainability and ecotourism

Definitions of tourism are a much debated subject and have resulted in a range of definitions depending on the situation in which they are used. The World Tourism Organisation defines tourism as (WTO, 2006):

"The activities of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes not related to the exercise of an activity remunerated from within the place visited."

Tourism definitions usually either focus on the demand side or the supply side. An example of a demand centred definition, which is the most common method of describing tourism, is (Doswell, 1997, p.6):
"The activities of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes."

The description of tourism from a supply point of view is often portrayed through its complex puzzle of business participants. Cooper *et al.* (1998) call tourism supply in a destination aspect as an amalgam of components, split into four categories. The first category is the different attractions of a destination. An attraction can be for example a dive site. The second category is the amenities, which can be accommodation, catering, retail and entertainment. The third element is described as access, including local transport and its terminals. Finally, and maybe most importantly, are the ancillary services, meaning all additionally or supplementary services such as the various local organisations and businesses.

1.2.1. Ecotourism

Ecotourism is a niche within the greater tourism spectrum. Ecotourism, regarded also as sustainable and low-impact tourism, exist in most parts of the world today, but in different forms and with different interpretations of the term *ecotourism*. Some countries have clearly defined ecotourism national strategies, while other countries are still in an early stage of developing ecotourism initiatives (Ceballos-Lauscurain, 1998). There is a wide range of definitions of ecotourism, with a variety of interpretations, depending on the perception of the author behind the definition (Tepelus & Cordoba, 2005).

The Ecotourism Society is a North American based international organisation consisting of ecotourism specialists, in addition to members from the ecotourism industry. Their ecotourism definition is (Lindberg & Hawkins, 1993, p. 2):
"Responsible travel to natural areas, which conserves the environment and improves the welfare of local people."

The World Conservation Union (IUCN) uses the following definition of ecotourism (Ceballos-Lauscurain, 1996 in Ceballos-Lauscurain, 1998, pp. 3):
"Ecotourism is environmentally responsible travel and visitation to relatively undisturbed natural areas, in order to enjoy and appreciate nature (and any accompanying cultural features - both past and present) that promotes conservation, has low visitor negative impacts and provides for beneficially active socio-economic involvement of local populations."

Ecotourism has become a rapidly growing trend or segment within global tourism and development. It is often considered as the pathway to sustainable tourism, and therefore fitting in with the more general movements en route for sustainable development in today's international society. Ecotourism is considered one of the fastest growing sub-divisions of the broad total tourism market (Tisdell, 1998). More accessible ecotourism sites and increased awareness among the general tourist are just two of many reasons behind the growth of ecotourism. The urbanisation of society additionally contributes towards a yearning to experience nature and something dissimilar from people's daily routines. However, some of the comparable reasons are also why ecotourism is a very sensitive industry. Its success depends on the sustainability of its resources, mainly its uniqueness and pristine condition of nature and/or authenticity of culture. An uncontrolled increase in ecotourism and number of ecotourists might actually deteriorate the attraction of the ecotourism site (Tisdell, 1998).

Along with the general trend of "green politics" in the 1980s, tourism also moved on to the politically correct environmental sustainable development issues. Terms such as ecotourism, nature tourism and sustainable tourism evolved. Environmental impacts from tourism climbed higher up on the agenda of tourism development. The general environmental views of sustainable development are often anthropocentric in the sense that humans are seen as being separate and superior to nature, and that the purpose of nature is just being a set of resources for human to consume. Conservation is understood as a tool for inter-generational sustainability, preserving a certain amount of resources for future generations. The technocentric view of nature is further expressed through

externalising the natural environment and suggesting that any potential environmental problems can be solved through technology and science expertise (Holden, 2003).

In contrast to the anthropocentric view of nature is "eco-holism" or "ecological extension". This view considers humans as part of nature, with ecosystems as interrelated webs of life, rather than just resources. Some suggest that a shift in the general ethics of environmental tourism issues is needed, from an anthropocentric and technocentric approach, to a view which considers nature as a value in itself even though this might conflict with some social and political aspects (Holden, 2003).

From an international perspective, Costa Rica is considered as a prime case of a successful ecotourism destination. The country has 6% of the world's biodiversity within just 0.3% of the world's surface. A certification system for sustainable tourism has been developed, and sustainable tourism is defined as (ICT, 2001 in Tepelus & Cordoba, 2005, p. 136):
"The balanced interaction between three basic factors within the tourism industry: proper stewardship of natural and cultural resources, improvement of the quality of life of the local communities; and economic success, that can contribute to the programs of national development."

Other typical sustainability principles within Costa Rica's tourism sustainability program are the involvement of all stakeholders, facilitating for public participation and inclusiveness. Transparency is also considered as very important with objective monitoring of the implementation of sustainable tourism strategies (Tepelus & Cordoba, 2005).

An important element of ecotourism, and one of the imperative ingredients that separate ecotourism from tourism, is interpretation. The ecotourist is not only observing a natural setting or animal, but learning about it and realising its value. The role of interpretation in ecotourism is complex. By raising the awareness of the visitor about the natural environment around him or her, the potential negative impacts the individual tourist has

can be minimised or avoided. Another important factor of interpretation is connected with visitor satisfaction. An ecotourist usually wants to feel that he or she has either learned something or in some way contributed to conservation (Wearing & Neil, 1999). However, Duffy's (2002) study of ecotourists in the Caribbean showed that their main reason for having an ecotourism holiday was escapism and getting away from it all (for example urban stress). Interpretation includes a range of different communication tools, including displays, maps, visitor centres and guided tours (Wearing & Neil, 1999).

Ecotourism has its roots in the environmental movement with its basis in nature conservation for the purpose of human well-being. This vision has evolved into today's more scientific view of nature from environmental movements, including the importance of biodiversity and the intrinsic value of ecosystems (Wearing and Neil, 1999).

Sustainability might be a goal and strategy for ecotourism, but it is not necessarily a certain or automatic outcome of ecotourism (Jones, 2005). Deng *et al.*(2002, pp. 422) state:

"*No type of tourism can be sustainable in the absence of appropriate planning, monitoring, evaluation, and management; and sustainable nature-based tourism or ecotourism development can only be achieved when the behavior of destination managers, stakeholders, and tourists is ecologically, economically, and ethically responsible.*"

The above statement incorporates what should be the basic criteria for successful ecotourism. The responsibility of sustainability covers the authorities, destination managers and suppliers, local and other stakeholders in addition to the ecotourists themselves. Ecotourism, like sustainability, is not a goal in itself, but a pathway with constant adoptions and improvements (O'Riordan, 2000; Deng *et al.*, 2002).

1.3. Tourism and ecotourism in South Africa

Africa offers a wide variety of tourism products from safari, wildlife and cultural tourism to beach and marine tourism. Africa receives only 4.4% of all international stayovers

(WTO, 2005). South Africa has been the country receiving most tourism in Africa over the past recent years (Dieke, 2001). Non-consumptive tourism (as opposed to angling and hunting) is now the most popular form of nature experience in bigger travel markets such as the USA and the demand for eco- or sustainable tourism is growing. South Africa has the opportunity to take advantage of the country's position with relatively unspoilt nature and tourism development. Additionally South Africa is now recognised as relatively politically stable with currently much "good will" on the international political scene. South Africa is at current time considered a trendy and politically correct ecotourism destination (Christie, 1995). Tourism, especially ecotourism, gives the environmental resources economic value and a positive argument for its preservation. However, nature conservation in development countries including South Africa must run parallel with social development and sustainability (Christie, 1995).

The White Paper on Tourism emphases the development of responsible tourism and collaboration between public and private sectors in tourism development. Ecotourism, cultural tourism and promoting the uniqueness of South Africa are priorities in the long-term national tourism strategy (SATOUR, 1996 in Dike, 2001). Ecotourism activities and industries need to be managed in order to ensure ecological, ethical and economic sustainability (Deng *et al.*, 2002).

Tourism trends in South Africa show a decrease in urban tourism and an increase in ecotourism. The National Parks and the safari experiences are popular, but with the Kruger Park attracting the most international visitors. The past years have also seen the development of several private, mainly upmarket, game lodges. Ecotourism development in South Africa is based on a controversial background. The use of wildlife was mainly by English and Afrikaners hunting either for commercial or sport purposes. The Black communities were subsistence hunters, but lost their rights to hunt as the wildlife became in short supply (Dieke, 2001).

The province KwaZulu-Natal is a very popular holiday destination for domestic tourists. It offers the Drakenberg mountains, the "Big Five" in the game reserves, the Zulu culture

and maybe most importantly the warm Indian Ocean and its beaches and coastal resorts (Allen & Brennann, 2004). The majority of the domestic tourism to the KwaZulu-Natal region consists of tourists visiting friends and family with enjoying the beach as the main activity (Prayag, 2004). Unfortunately, KwaZulu-Natal experiences great competition from Gauteng and the Western Cape concerning the international market. Cape Town is the most popular and visited city by international tourists in South Africa, while Johannesburg in Gauteng is the main entrance point for most international travellers (Prayag, 2004).

1.4. Marine tourism in South Africa

Orams (1999, pp.9) defines marine tourism as follows:
"Marine tourism includes those recreational activities that involve travel away from one's place of residence and which have as their host or focus the marine environment (where the marine environment is defined as those waters which are saline and tide-affected)." Marine tourism is discussed in detail in chapter 3.

A study conducted by Tourism KwaZulu-Natal (2001) suggests that South Africa should take advantage of its potentials for international beach tourism similar to that of Kenya and Mauritius. South Africa has the coastal resources for this type of tourism and it already exists, but mainly on a domestic level as international tourists tend to favour safari and cultural tourism as described previously. The study by Tourism KwaZulu-Natal (2001) proposes an increase of 400 000 beach tourists annually which is said to be easily absorbed by some of the already existing infrastructure, but with a need for increased access (air), intensive marketing campaigns, excellent environmental management, zoning of the development and investment in further tourism infrastructure. The target market would be Europe. South Africa has the advantage of not having participated in the South European and Caribbean boom of beach tourism in the 1980s and can learn from other destinations' mistakes and rather develop the beach tourism based on sustainability principles. Other African beach destinations' such as Mauritius have successfully accomplished this. However, the political goals of the new South Africa with ecotourism and socio-economic development might not fit into this picture.

In fact it could be difficult to avoid the traps that previously ensnared other beach destinations (Tourism KwaZulu-Natal, 2001).

South Africa has on the other hand vast and varied resources for marine ecotourism products. There is also a great future potential in increasing ecotourism. Marine ecotourism products are not among the main attractions in South Africa international tourism marketing. In many cases marine ecotourism products do not feature at all. However, there are many unique marine tourism attractions offered along the South African coast. Along the Eastern Cape there is several land- and boat-based whale watching operators. In addition there is shark and marine bird watching tourism. The Cape area offers penguin and seal ecotourism. KwaZulu-Natal offers permitted turtle watching tours within the Greater St. Lucia Wetland Park. The coast of South Africa offers unique diving opportunities from the colder southern waters with kelp, seals and cage diving with white sharks, to shark diving in Southern KwaZulu-Natal and diverse coral reefs in Northern KwaZulu-Natal (Tourism KwaZulu-Natal, 2005a).

South Africa and the Eastern African region in general have a history of protecting terrestrial areas of tourism interest rather than marine areas. There is an increased global awareness of the need for protecting marine areas, but need for further research and knowledge in places such as the Eastern region of the African continent and the Indian Ocean. Coral reefs, mangroves and sandy beaches are of specific interest and these natural features are also of imperative significance to marine tourism. However, marine tourism can also be a threat to ecological sustainability if developed and managed in an unsustainable manner, in addition to other issues such as souvenir trading of threatened species in order to provide income from tourism (Robinson, 1995).

1.5. Marine tourism and diving in KwaZulu-Natal

Two of the top three dive sites in KwaZulu-Natal are marine protected areas (MPA) namely Aliwal Shoal off Umkomaas and Sodwana Bay. Sodwana Bay is protected as part of the Greater St. Lucia Wetland Park and has recently also been proclaimed a World Heritage Site. Both Sodwana Bay and Aliwal Shoal are within marine protected areas with relatively strict codes of conducts to follow when diving in order to ensure a

sustainable dive industry. The main attraction of Sodwana Bay is the colourful corals, while Aliwal Shoal is famous for its winter migration of the Spotted Ragged Tooth sharks (*carcharius taurus*). Specific regulations apply to the management and use of Sodwana Bay as a dive site and a zoning system for ecotourism dive use has been suggested (Schleyer & Celliers, 2005). Sodwana Bay dive sites are regulated and managed by Ezemvelo KwaZulu-Natal Wildlife (EKZNW). A range of restrictions and condition apply to both dive operators and divers (KZN Wildlife, 2005).

Aliwal Shoal was declared a marine protected area in June 2004 by the Minister of the Department of Environmental Affairs and Tourism under section 43 in the Marine Living Resource Act of 1998. The objectives of creating the Aliwal Shoal Marine Protected Area are (DEAT, 2004, pp. 5):

1. Protect and conserve the marine ecosystem and populations of marine species in and around Aliwal Shoal;
2. To reduce user-conflicts over the use of the Aliwal Shoal; and
3. Promote dive ecotourism within the protected area.

The Aliwal Shoal Marine Protected area is divided into two restricted zones and one controlled zone. No fishing is allowed in the restricted zone, and regulations apply for fishing in the controlled zone. Both private divers and dive operators need specific permits for any dive activities, and no mooring or anchoring is allowed within the protected area. As part of the declaration of Aliwal Shoal as a marine protected area, it is stated that a management plan is to be developed (DEAT, 2004).

Diving within a MPA is legislated under the Living Marine Resource Act. Specific permits are needed for both private recreational divers and commercial dive operators. There is also a system of fees in association with the dive permits (DEAT, 2005a).

Protea Banks is considered as one of the three top dive sites in KwaZulu-Natal, thus having a high potential ecotourism value. However, Protea Banks does not currently have status as a marine protected area and therefore no specific management plan or other regulations.

1.6. A brief introduction of the study area Protea Banks

Protea Banks is a reef which is situated off Margate and Shelly Beach located on the Hibiscus Coast south of Durban. The South Coast area has a long history as a popular marine tourism destination.

Protea Banks has various user groups, mainly recreational fishermen, charter fishing operators and diving operators with incoming dive tourists. The main attraction for the divers is the sharks. The attractions for the recreational fishermen are bottom fish and game fish, including sharks.

There has been a local user group dispute between a charter fishing company and a dive operator concerning the sustainability of the use of sharks as a consumptive tourism attraction for the charter fishing industry. The Zambezi shark (*carcharhinus leucas)* has been the main focus of the conflict. There are no specific regulations or legislation for Protea Banks, neither as a marine resource or as a tourism attraction. Protea Banks is further described in chapter 2.

1.7. Previous studies conducted at Protea Banks

As far as could be ascertained there has previously been only one study conducted which has included Protea Banks. The study was a collaboration between the University of Ghent in Belgium, the University of Cape Town and Marine & Coastal Management over a six year period from 1999 to 2005. The focus of the study was seaweed: Clorophyceae (green algae), Phaeophyceae (brown algae) and Rhodophyceae (red algae). The study resulted in a published book which is a guide to seaweeds in KwaZulu-Natal. One species of (brown) algae was only found and collected at Protea Banks in South Africa (De Clerck *et al.*, 2005).

Shelley Beach is the main launching site for Protea Banks. A study by Pradervand (2005) on behalf of the Oceanographic Research Institute (ORI) included Shelley Beach and described the charter boat fishing in KwaZulu-Natal. The study expressed a concern for

the rapid growth in the number of new charter fishing operators, the long term sustainability of some of its fish catches and the management of charter fishery.

The Protea Banks reef is situated at too great depth for the Ezemvelo KwaZulu-Natal Wildlife researchers to involve the area in any of their marine studies (Laurance, 2005). The Oceanographic Research Institute based in Durban has proposed a study of Protea Banks reef, but has so far been rejected funding thus it has not been conducted any official research or studies of this specific area and its ecosystem (Schleyer, 2005).

Local dive operators have over the years recorded shark frequency and abundance at Protea Banks. Shark behaviour has also been recorded (Cobb, 2005).

1.8. Rational for the study

There is a general lack of marine tourism studies compared to terrestrial tourism studies. Protea Banks is an interesting marine tourism case study as there are previously almost no official studies conducted in association with the reef even though it is a popular area with a purported expanding tourism industry.

Stakeholders' involvement in decision making and management is an important political tool for fairness, but also long-term successful site specific management of natural resources. A marine area can be the bases for peoples' living or as a recreational site. The management of an area should be based on the local, direct and indirect stakeholders' opinions and knowledge to ensure sustainability.

There is no site specific management plan for Protea Banks as a marine tourism resource. There might be a need for specific regulations for Protea Banks in order to ensure that the area is used in a sustainable manner for the purpose of marine tourism.

Protea Banks is one of three top dive tourism attractions in KwaZulu-Natal, but is not a protected area in contrast to the other two sites. There is a concern among the local dive community about the lack of shark fishery management and a supposed decrease in the

local, national and international shark stock. There has been conflict between stakeholders concerning the use of marine resources at Protea Banks involving marine tourism operators.

The White Paper for Sustainable Coastal Development in South Africa (DEAT, 2000) calls for integrated coastal management with the aim of sustainable management of marine and coastal resources. Tourism is considered as one of the most important present and future industries in the coastal zone, and conflicts amongst user groups should get assistance towards being resolved. Stakeholders' involvement in coastal zone management is one of the basic principles of the policy.

1.9. Aim and objectives of the study

The aim of the study is to produce a set of site specific marine management plan recommendations, towards sustainable planning, development and management of Protea Banks as a marine tourism destination.

The objectives of the study are to:

1. Identify current user groups (direct stakeholders) at Protea Banks.

2. Identify current practices and uses, guidelines and code of practices in association with Protea Banks mainly as a recreational and tourism resource.

3. Determine the stakeholders' views:
    a. on the value of Protea Banks as a marine tourism resource and its management issues.
    b. on user conflict issues and how these issues can be resolved.

4. Determine stakeholders' opinions of shark management and conservation.

5. Examine why Protea Banks is not a marine protected area (MPA), and determine whether there are any indications that it should be an MPA, based on stakeholder opinions, and to ascertain if other conservation measures are needed towards a sustainable management approach for Protea Banks.

1.10. Chapter outline

Chapter 2 describes the study area from a marine tourism and management point of view. The reef Protea Banks and its main launching site Shelly Beach are presented together with their main user groups with reference to marine tourism. Local user group conflicts in relation to marine resource use, especially regarding sharks, are presented. The final part of the chapter presents legislation and regulations affecting the management of Protea Banks as a marine tourism destination, and more importantly the lack of implementation.

Chapter 3 gives a description of marine tourism. Recreational diving and interaction with marine wildlife with the main focus on sharks are discussed, and recreational fishing is presented. Marine conservation and tourism is an important topic presented in this chapter, followed by Marine Protected Area and user conflict within marine and protected areas. Chapter 4 is a description of the methodology used for this study.

Chapter 5 is a presentation of various perceptions of sharks and shark management. The first part of the chapter is a brief historical presentation of shark management and marine tourism in KwaZulu-Natal focussing on the South Coast which includes the area of Shelley Beach. The historical presentation is based on media cover of events and issues related to shark and tourism. It is meant to put forward the general perception of sharks and how this perception might have changed over time due to issues such as increased scientific knowledge and the precautionary principle. The second part of the chapter describes shark management, shark fishery and shark conservation.

Chapter 6 presents results of the study. The results are divided into sub-themes and are discussed both separately and in conjunction with each other. Chapter 7 relates to the aim

of the study and presents recommendations towards a management plan for Protea Banks, in addition to concluding remarks.

2. THE STUDY AREA: PROTEA BANKS

This chapter presents Protea Banks from a marine tourism and management point of view with a description of the marine area's natural features, including a description of the Zambezi shark which is considered a main attraction for tourist divers visiting the reef. The main user groups relevant for this study and user group conflicts are presented, in addition to legislation applicable for Protea Banks.

2.1. Diving at Protea Banks

Protea Banks is a dive site located approximately 7-8 km off shore between the tourism destinations Shelly Beach and Margate on the Hibiscus Coast South of Durban (Jackson, 2000). The geographical location of Protea Banks is South 30' 50' 12", East 30' 28' 54" (information provided by Roland Muntz at African Dive Adventures, 2005).

Figure 2.1. Tourist map of South Africa's dive sites from Dive South Africa (2005)

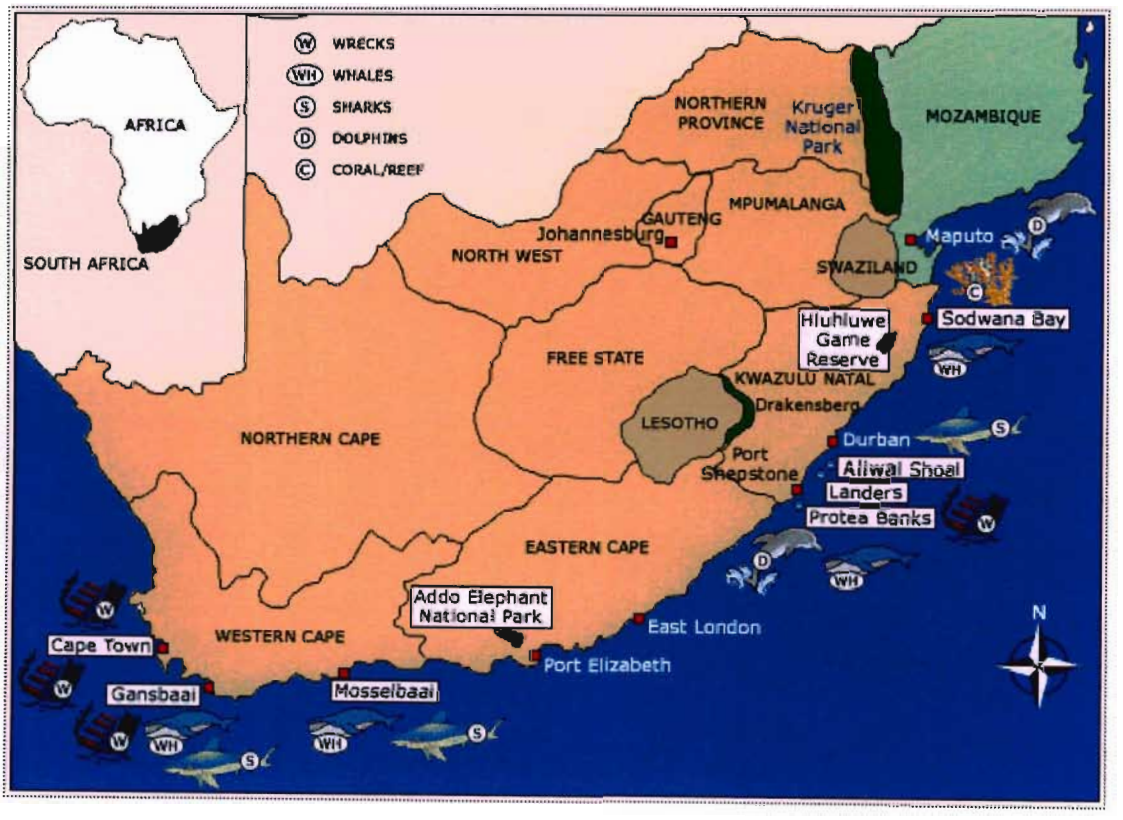


Figure 2.1. is a tourists map illustrating the location of popular dive sites along the South African coastline. Protea Banks dive site is situated in the Southern part of KwaZulu-Natal.

Protea Banks is a fossilised underwater sand dune. The reef is approximately 6km long, stretching from north to south and is around 800 meters wide. The maximum depth is 50-60 meters and the highest point of the seafloor is at 27 meters below the sea surface (Jackson, 2000).

Diving at Protea Banks is considered as extreme shark diving, with its depths starting at 27 meters and there are often strong currents. Drift dives usually move with a speed of 1-2 knots, but can reach up to 4 knots. The dive site is divided into the Northern and the Southern Pinnacles. The Northern Pinnacles are located at 30 to 36 meters of depth and can only be dived if the current is not too strong. Normal maximum depth is 30 meters (Jackson, 2000).

Commercial diving at Protea Banks started in 1991 using local commercial fishing boats to access the site. At present time rigid inflatable boats (rubberducks) are used. Anyone wishing to dive Protea Banks must hold an advanced level open water dive certificate (mainly due to the depth). A thorough dive briefing is also needed, and the group of divers (usually maximum ten) normally descend and ascend as a group, not separately (Jackson, 2000).

2.1.1. Attractions for dive tourism at Protea Banks

The main attractions at Protea Banks for the dive tourists are sharks. Shark species found at Protea Banks include Ragged Tooth Sharks (*carcharias taurus*) during the winter months and Zambezi sharks (*carcharias leucas*) during summer months. Tiger sharks (*galeocerdo cuvier*), Scalloped Hammerhead sharks (*sphyrna lewini*), Smooth Hammerhead sharks (*sphyrna zygaena*) and Great Hammerhead sharks (*sphyrna mokarran*) are assumed to be in the area all year round. Additionally, there are occasional sitings of other shark species such as the Great White Shark *(carcharodon carcharias)*,

the Blacktip Shark (*charcharhinus limbatus)*, the Duskey Shark (*charcharhinus obscurus)*, the Bronze Whaler Shark *(charcharhinus brachyurus)* and the Whale Shark *(rhincodon typus)*. Protea Banks is an internationally recognised and increasingly popular dive site with visiting dive tourists travelling specifically to experience diving with wild sharks in their natural habitat without any feeding, baiting or cages involved. The main attraction for the divers is the possibility of viewing Zambezi sharks (KZN Wildlife, 2005; Tourism KwaZulu-Natal, 2005a; Jackson, 2000).

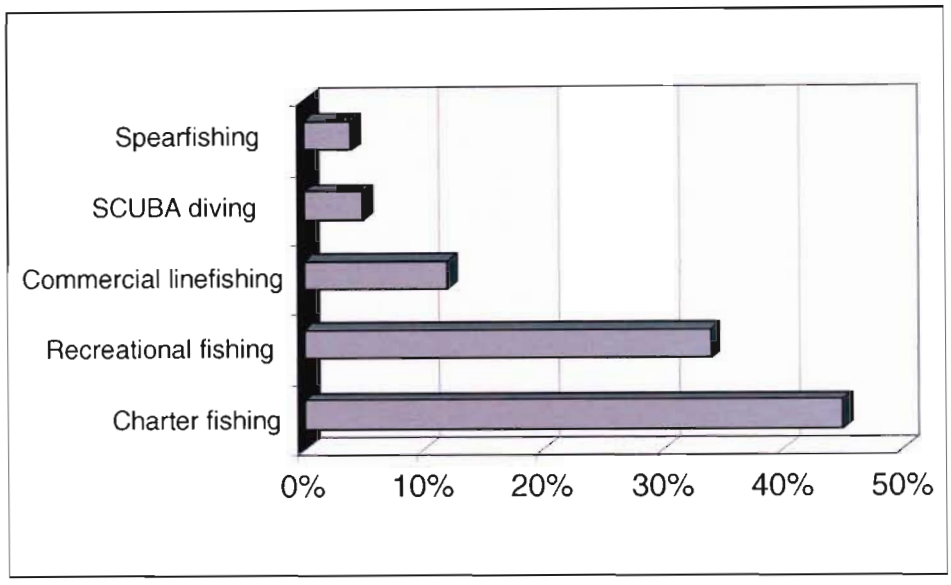
2.2. Recreational fishing at Protea Banks and boat launches from Shelley Beach

Protea Banks is also a popular area for recreational sport fishing and charter boat fishing. The target species for charter fishing is bottom (reef) fish (43%), gamefish (41%), billfish (15%) and sharks (1%). The fishing effort and target species depend on the season. At Shelley beach gamefish is the main target during winter, while the rest of the year has a more equal distribution between bottom fish and gamefish (Pradervand, 2005).

The vast majority of boat launches for the purpose of visiting the Protea Banks area are conducted from Shelly Beach. An estimated 6317 launches took place here during 2003, with an average daily number of launches of 17. The majority of the launches were for the purpose of charter fishing with 2836 (45%) launches. A total of 2159 (34%) launches were for the purpose of recreational linefishing, while commercial linefishing accounts for 773 (12%) of the launches (see Figure 2.2.). Boat launches for the purpose of charter SCUBA had a total of 314 (5%) during 2003, and spearfishing boat launches account for 234 (4%) of the total launches (Celliers *et al.*, 2003).

Boat launches during 2004 along the KwaZulu-Natal coast including Shelly Beach showed that over half (53%) of the launches was for non-commercial purposes, 37% for charter purposes and 10% for commercial functions. The overall dominant activity and purpose of the majority of the launches were different types of fishing (68%). Commercial SCUBA diving accounted for 21% and charter fishing for 11% of the total boat launches (Pradervand *et al.*, 2005).

Figure 2.2. Boat launches at Shelly Beach 2003 based on Pradervand *et al.* (2005)



A study by Pradervand (2005) on charter boat fishing in KwaZulu-Natal found that Shelley beach has the highest charter boat effort along the coast (34%). Domestic tourists are the main market segment (71%), resulting in a strong seasonality with significant peaks during school holidays, mainly December. The interest for charter boat fishing has increased rather drastically over the past decade. The number of licences issued for the purpose of charter boat operations increased from 2 in 1989 to 73 in 2003. The increased and seasonally intense use of Protea Banks can potentially have adverse effects on the marine ecosystem if not managed in a sustainable manner.

The majority of the charter boat clientele are from other regions than where the fishing takes place, thus contributing to the tourism industry in the launching area (Pradervand, 2005). However, there is an expressed concern about the rapid increase and lack of control of the charter boat industry. Additionally, the targeting of vulnerable bottom fish is of concern. The insufficient policing and enforcement of regulations in association with the charter boat industry needs improvement. It is also recommended to make charter boat operations a controlled-access fishery. Charter boat pressure at Shelly Beach is considered to be extremely high. A maximum number of charter boats per launching area along the KwaZulu-Natal coast is recommended (Pradervand, 2005).

2.3. The state of the species Zambezi shark (*carcharhinus leucas*)

The Zambezi shark (*carcharhinus leucas*) is, as mentioned previously, one of the main attractions for the dive tourists at Protea Banks. The local dive operators at Shelly Beach are concerned about the future of sharks in general and the lack of sustainable shark fishery management. At Protea Banks the Zambezi shark (*carcharhinus leucas*) is of particular concern (Sharklife, 2005).

The Zambezi shark (*carcharhinus leucas*, previously also known as *carcharias zambezensis*) (Bass *et al.*, 1973) is called Bull shark in other parts of the world including Australia and the United States of America (USA). The new born Zambezi is usually between 60 and 70 cm in length. The sharks mature at around 225 cm, but can reach 3 meters. The Zambezi is found in the warm and tropical marine environments worldwide (Bass *et al.*, 1973; Compagno & Smale, 1989). The Zambezi has a heavy body and large jaw with triangular serrated teeth. The snout is rounded and the shark's body is dark grey above and white below (Compagno & Smale, 1989).

Most cartilaginous fish like the sharks are affected by water salinity, temperature and depth with species-specific conditions limiting the locations in which a certain species is found (Compagno & Smale, 1989). However, Zambezi sharks have the ability to swim in freshwater and have been found up rivers in many countries including Nicaragua, Guatemala and Australia. In fact the Zambezi got its name in the southern parts of Africa from the fact that it can be found up to 1,120 km inland up the Zambezi river system. The Zambezi is commonly found in shallow in-shore water areas, such as coastal and estuary systems, but also occasionally is located in deep water. The estuaries are important breeding areas for the Zambezi sharks (Bass *et al.*, 1973).

The Zambezi feed on fish and marine mammals such as cetaceans and turtles, in addition to sea birds. The Zambezi is also known for being a scavenger, especially during the whaling history of Durban when sharks would attack whale carcasses that were being pulled after whaling ships into the Durban Harbour. The Zambezi shark is considered as

potentially very dangerous, maybe even the most dangerous, to humans and has been responsible for various attacks on the Natal coast (Bass *et al.*, 1973).

Sharks may be the apex predators of the ocean, but populations are very fragile due to over-fishing. They also have a very long maturation period before they start reproducing. Even when sexually mature, they still produce very few young per year (Compagno & Smale, 1989).

The Zambezi shark is unique compared to any other shark, due to the osmotic capability of its kidneys to balance salinity differences between fresh and saltwater. The Zambezi sharks spend much more time than other sharks very close to the shore, in estuaries and up rivers. Especially for young sharks, estuaries and rivers are important areas of protection from predators. These areas also function as breeding areas for the Zambezi (Compagno & Smale, 1989).

General degradation and human development of estuaries are believed to affect the general breeding patterns of the Zambezi. However, few studies have been conducted on the actual effect this might have had on this particular type of shark. Another issue concerning decreasing frequency and abundance of sharks is the controversial shark nets. The numbers of Zambezi sharks caught are decreasing, but also the size of the caught sharks is diminishing. This can be alarming as the Zambezi reaches maturity only at the age of 20 years. However, the Natal Sharks Board, responsible for the shark netting in KwaZulu-Natal claims that this is only a tiny percentage of the commercial shark fishing and has no crucial effect on the total shark population (Smithers, 2005).

A total of 772 Zambezi sharks were caught in the shark nets along the KwaZulu-Natal coast between 1978 and 1990. The majority of the catches occurred between October and May with a peak in December, and most of the sharks were non-mature (less than 180-190 cm) (Cliff & Dudley, 1991). The mean water clarity at the time of the catches was around two meters. The majority of sharks were caught within the northern area of

KwaZulu-Natal and were mostly juveniles. The impact of netting Zambezi sharks is said to be large but localised (Cliff & Dudley, 1991).

An example underpinning localised impacts of shark fishery is the case of the introduction of shark nets in 1991 at Mbango, 10 km north of St. Michael's-on-Sea on the South Coast, close to Shelley Beach. During the first weeks of netting 11 Zambezi sharks were caught here compared to only four along the other beaches. All of the sharks, except one were over 200 cm as opposed to the general catches of smaller and juvenile Zambezis. The difference in the catches was extraordinary in the sense of both number and size. This emphasizes the suggestion that Zambezis might be migratory throughout the year, but still localised during certain periods. A localised group of large Zambezi sharks had survived the many shark nets along the coastline for several decades, until additional nets were installed within their specific local area. This case also shows the effectiveness of the shark-nets as shark eliminating tools for the purpose of marine beach tourism (Cliff & Dudley, 1991).

2.4. Different user groups and conflict at Protea Banks

Protea Banks is an important recreational area with intangible but high social value for both local users and incoming domestic and international tourists. Protea Banks is also economically significant on a local level as a job and income resource for commercial charter fishing operators and dive operators (ref. personal observation).

Protea Banks as a marine resource for different user groups has created conflicts between certain stakeholders. One conflict has been between divers and the local commercial fishing industry concerning sharks fishery. Shark fishing was encouraged as the Australian market for shark meat was increasing. In Australia shark meat is popular for the use of "flake and chips" (shark meat and potato chips). Local fishermen were paid by the local fishing industry per kilo of shark meat and the meat was exported to Australia. A shark is valued around R50 000 for the purpose of ecotourism (Tourism KwaZulu-Natal, 2005a), while the price for shark meat is just a few Rands (Carte Blanche, 2001). However, the commercial shark fishing around the Protea Banks area is said to have

decreased, much due to change of ownership of the local fishing company (Carte Blanche, 2001).

Another problem is shark fishing for the purpose of the fins. Shark fins are very highly priced in certain countries. Commercial shark fishing might have decreased in the Margate area, but other places in South Africa do conduct a high scale commercial shark fishing industry. Local divers at Protea Banks have experienced a general decrease in the frequency and abundance of shark sightings during dives, and are very concerned (Carte Blanche, 2001; Carte Blanche, 2000). A shark specialist, Dr Campagno, at the SA museum in Cape Town states (in Carte Blanche, 2000):
"*Sharks are not as resilient to over-exploitation as other fish species are, as they have a very slow reproductive rate and produce few young.*"

The current, almost a decade old dispute at Protea Banks is between the local divers and a fishing charter. The fishing charter company offers shark fishing. Many of these sharks are Zambezi sharks as they are not considered as a protected species, and are therefore legal to catch. The only limitations are the legislated bag limits through the Marine Living Resource Act of 1995 which recently changed from ten Zambezi sharks per person per day to one Zambezi shark per person per day (DEAT, 2005b). The Great White shark, Basking shark and whale shark are protected, but rarely seen in the area of Protea Banks. The Ragged Tooth shark is also partially protected. These facts put even more pressure on the Zambezi shark, as it becomes one of the few legal big sharks caught by the local fishing charter (Smithers, 2005). The dispute reached one of its peaks with a meeting of the two parties in court in August 2003. This specific case concerned a local dive operator and an NGO called Sharklife (previously Joint Awareness Group for Sharks). They created a pamphlet and distributed it in the local area. The pamphlet was an outcry against the local fishing charter and their unnecessary killing of several Zambezi sharks for the purpose of the shark and its teeth as trophies. The pamphlet encouraged the public to show their disagreement with these actions and fishing methods. The court case highlighted the need for both user groups to conduct sustainable use of marine resources and to talk to each other in order to try to resolve this conflict.

However, the dive operator was allowed to distribute the pamphlets which are still in circulation, as the pamphlet was considered by the court as not portraying the fishing charter as different from the way that it actually promotes itself (Bishop, 2002; Oellermann, 2003). However, the conflict is still ongoing and a solution does not seem to be close between the two stakeholders (Sharklife, 2005). There might be a need for a third party (such as legislation, regulation or authorities) to intervene in order to assist in solving the dispute.

2.5. Legislation applicable for Protea Banks

Policies are often a reflection of a nation's overall values and priorities. However, policies are also affected by individuals with special interest about certain issues getting involved in policy making (Hall & Jenkins, 1995). Their involvement can be through political parties, but also through lobbying and non-governmental organizations. Tourism policy making is often based on compromises between economy and the environment and often considered a tool for increasing income and employment, while overlooking social and environmental aspects and problems of the place and situation. The last decade's trends of decentralization with power from central to local government also include an inclination of collaboration between authorities and private companies. Tourism is strongly driven by its economical success as a business. Additionally, the tourism business is increasingly declaring that self-regulation concerning environmental impacts is desired as opposed to government regulation. Public participation is regarded as essential in tourism policy making and in theory all interested and affected parties should be able to participate in the preparation of political decision making (Hall & Jenkins, 1995). Policies need not only to be planned, produced and implemented, but continuously monitored and evaluated in order to see if they actually reach their goals (Hall & Jenkins, 1995).

There is some current legislation which applies both indirectly and directly to Protea Banks. Firstly, the Sea Shore Act of 1935. The Act states that the waters from the high water mark and 12 nautical miles out from shore are owned by the state for the use and benefit of the public. From 1995 the key administrative provisions of the Act were

assigned to the coastal provinces (KwaZulu-Natal for Protea Banks) (DEAT, 1998). A KwaZulu-Natal draft regional coastal policy based on the White Paper on Coastal Policy (2000) has been created by the KwaZulu-Natal Department of Agricultural and Environmental Affairs. The principles of the draft policy are based on integrated coastal management, as underscored in the White Paper on Coastal Policy. The draft policy recognizes Protea Banks (together with Aliwal Shoal) as one of the top 25 coastal assets of the province. The draft policy has a people-centered and integrated approach to management, and it underlines the value of the coast and the importance for sustainable development of coastal resources (Tourism KwaZulu-Natal, 2005b).

The National Environmental Management Bill of 1998 (NEMA) also affects marine management. Some of the main principles are sustainable development, minimisation of environmental degradation and equitable right of public access. Other important issues are integration and collaboration between governmental institutions. NEMA emphasizes the importance of stakeholder involvement and public participation in management and decision making (DEAT, 1998).

The Green Paper on Coastal Policy (DEAT, 1998) lists several important aspects of integrated and holistic coastal management. The coastal areas have social values (recreational, spiritual, social meeting place), economic values (existing businesses based on coastal resources, potential for future development), and biophysical values (value of ecosystems). A range of different users directly affect each other and might have different interests. For example, there are at least 100 000 scuba divers using the various South African dive sites. This activity is worth over R36 million per year. There are an estimated 600 000 recreational fishers in addition to 131 000 employed fishermen, generating R1.3 billion annually (especially in KwaZulu-Natal). The Green Paper identifies the fact that the current coastal legislation is very fragmented and needs coordination and integration (DEAT, 1998).

The coast is defined as (DEAT, 2000, part 3.1.):

- coastal waters, which extend from the low water mark into the sea, up to the point where these waters are no longer influenced by land and land-associated activities.

- the coastline or sea shore, which is the area between the low and high water marks.

- coastlands, which are inland areas above the high water mark that influence or are influenced in some way by their proximity to coastal waters (these areas may stretch many kilometers inland).

2.5.1. Public participation in decision making and coastal management

The White Paper for Sustainable Coastal Development in South Africa (DEAT, 2000) is based on the Coastal Policy Green Paper (1998) and the general sustainability approach to a sustainable and an integrated coastal management approach for South Africa. The White Paper recognizes the need for specific management approaches in association with coastal areas and their unique attributes and values. South African coastal resources account for over 35% of the total GDP, underlining the coasts economic value and further potential for the country. The White Paper outlines a people-centered approach (as opposed to a previously resource-centered approach), with emphases on sustainable, coordinated and integrated coastal development with shared responsibility among various stakeholders. Some of the main (sustainability) principles are:

- ✓ The coast as a national value with benefit and access for all;
- ✓ Optimizing the coast's economic value through development towards coastal communities and social wellbeing;
- ✓ Social equity, fairness and intergenerational sustainability;
- ✓ Ecological integrity (sustainability) with maintenance of biodiversity and rehabilitation of ecosystems or species where needed;

- ✓ Risk aversion and applying the precautionary principle in situations of uncertainty;
- ✓ Shared responsibility of coastal resources and all actions in association with these;
- ✓ Duty of care through acting towards minimizing negative environmental impacts;
- ✓ Integrated coastal management including an inclusive and participatory decision-making and managing process with full transparency; and
- ✓ Co-operative coastal management through partnerships and collaborations between the public and private sector and civil society, empowering stakeholders and enabling all to participate (DEAT, 2000).

The issue of public participation is very strong in the White Paper, and seeks to involve all stakeholders in coastal management, and to try to heal some of the damage from the previously segregating and unfair apartheid system.

Tourism is considered an imperative issue with development potential for the South African coast. Goal C1 of the White Paper states (DEAT, 2000): "To promote the diversity, vitality and long-term viability of coastal economies and activities, giving preference to those that are distinctly coastal or dependent on a coastal location". Promotion of tourism, leisure and recreation is listed as an imperative objective under this goal. Tourism is also listed under priority issues that emerged during the policy development process in addition to being present as a sector to be promoted under several other parts of the White Paper.

Theme D in the White Paper's list of important issues is natural resource management. The goals concern biodiversity conservation needs (maintaining the diversity, health, and productivity of coastal processes and ecosystems) and the need for the rehabilitation of degraded ecosystems. Another goal within this theme is the need for establishing, extending and properly managing a system of marine protected areas. Other issues include the importance of identifying conservation and other needs concerning natural resources, species and ecosystems.

Objective A3.7. states: "Conflict shall be resolved wherever possible in a collaborative, problem-solving, consensus-building manner". The focus is to be proactive, not reactive in conflict resolution. Institutional arrangements (as stated in NEMA) need to be developed to resolve conflicts concerning coastal issues and resources. A third party might be needed to reach consensus, and if this fails a negotiation process must be facilitated.

2.6. Shark regulations in South Africa

The Marine Living Resource Act of 1998 which regulate various types of fishing activity, was recently amended. Relevant for this study is the legislation concerning recreational shark fishing. There are now several shark species under the list of prohibited species; the Great White shark, the Basking shark and the Whale Shark. The Ragged Tooth shark (significant for dive tourism at Protea Banks) is prohibited from commercial fishing, but has a bag limit (number of catches per day per person) of one for recreational fishers. Recreational fishers need to obtain a permit in order to be allowed to fish. The Zambezi is not specifically legislated, but the limit is under the Act now reduced from a bag limit of 10 to a bag limit of 1 (DEAT, 2005b).

3. MARINE TOURISM: MANAGEMENT AND CONSERVATION

3.1. Introduction to marine tourism

There is not much detailed literature available specifically on marine tourism even though this form of tourism has a history of several centuries (Orams, 1999). There are historical references to people swimming, fishing and even sailing dating back many years BC. More recent history (the 18th century) tells of the development of seaside resorts in southern England. Cities like Brighton served as holiday sites for inland tourists during the industrial revolution. The resorts are still running today but have evolved into bigger cities (Orams, 1999). The development and growth of tourism and urbanisation along the coastline of the Mediterranean during the post Second World War era was largely due to the creation of the package tour and the start of using chartered air transport. People in general started to earn more money, and holidays become more accessible both financially and geographically (Doswell, 1997).

Travel has for decades been considered as an escape from daily routines, restoring or refreshing the tourist's physical and mental health. Beach tourism and "getting a tan" became high fashion, mainly due to Hollywood movies and their tanned movie stars. The dangerous effects of prolonged sunbathing became a hot topic in the 1980s. Tour operators and travel journalists, amongst others, advised beach tourists to protect themselves from sunburn and overexposure of sun (Laws, 1995). The increased awareness of the consequences of overexposure to UV rays is an example of a change in attitudes and tourists' behaviour, but also an example of the fact that some people just do not care for warnings of potential negative consequences of their actions anyway.

Beach tourism is a major division of marine tourism. In the USA one particular beach, Miami Beach, receives more visitors annually than Yellowstone, Grand Canyon and Yosemite National Parks collectively (Orams, 1999). The demand and supply of water sports products are expected to increase greatly. Smith and Jenner (1994 in Orams 1999) forecasted that watersports-based tours would increase from 0.75-1 million tours annually in 1994 to 2.5-5 million per year in 2000. Diving was estimated to account for 30% of the

watersports. Observation of marine flora and fauna is a popular attraction for marine tourists.

Marine tourism often overlaps with other descriptions of tourism, especially coastal tourism. Coastal tourism includes all tourism and recreational activities occurring within the coastal zone and coastal waters. Coastal tourism covers accommodation and cruise boats, catering, infrastructure, retail and other tourism product related producers. Coastal tourism also includes all the coastal activities such as swimming, diving, fishing and boating. Marine tourism is very closely linked to coastal tourism, but differs slightly. Marine tourism also includes open-water and off shore based activities such as deep-sea fishing and yachting (Hall, 2001). While coastal tourism can be said to focus equally on the terrestrial (i.e. beaches, marinas, coastal resorts) and marine environment (i.e. reefs, waves, lagoons), marine tourism has its main focus on the ocean element and activities in or in direct association with the water. Orams (1999, pp. 9) defines marine tourism as follows:

"Marine tourism includes those recreational activities that involve travel away from one's place of residence and which have as their host or focus the marine environment (where the marine environment is defined as those waters which are saline and tide-affected)."

Orams definition, however, does include all the aspects of tourism in general such as the transport element and the element of accommodation which is implied in the "travel away from one's place of residence". The most important factor of marine tourism is nevertheless the fact that the focus of the travel experience or the purpose for the activity is an aspect of the marine environment.

The impacts of tourism on marine areas have experienced a growing concern and issues related to the sustainability of tourism in general have influenced marine tourism research. It is today very well known that tourism can potentially have various negative impacts on the marine and coastal environment if not managed and controlled in a sustainable manner. However, the data on the impacts of tourism on marine areas is still

poor generally, especially in areas which are not protected or established as conservation areas. The main problem is the lack of baseline data and consistent monitoring and control. Diving which is considered as ecotourism and a non-consumption activity has in many marine areas caused severe damage on coral reefs by people finning, stepping on corals or touching the reef. It is not only the tourism industry which causes negative impacts on the marine environment. Over-fishing, pesticide run-offs from agriculture, sewage and other pollution also threaten the world's oceans (Hall, 2001).

3.2. Marine tourism management

Tourism in any kind or form will always have some types of impact on the environment, regardless of any mitigation of these impacts. The concept of carrying capacity was one of the first management strategies within sustainable tourism or ecotourism. This entailed limiting the numbers of users at any time in a natural area. However, it is increasingly realised that it is not only the number of people using the area that is critical, but how they use it, and it is necessary to manage the different types of ecotourists in different ways. The Recreational Opportunity Spectrum (ROS) created by Clark and Stankey in 1979 to be used by the USA Forrest Service for management purposes, is one of the first frameworks for managing tourism in natural areas (Orams, 1999; Borrie *et al.*, 1998). The ROS is a flexible and logic approach to natural area management. A total natural area is divided into different smaller areas based features such as access, available activities and need for protection. A total natural area can therefore supply a wide variety of visitors with the nature experience they prefer, while protecting the environment and managing the use of the area through zoning (Boyd & Butler, 1996).

The Tourism Opportunity Spectrum (TOS) is based on the ROS and is a framework for decision-making for tourism development and management. Updated data on the natural area using the TOS model can assist in establishing which activities should be allowed and regulated in which areas. The TOS is a tool for managing both the visitor and the natural resources, enabling tourism use while controlling the impacts (Boyd & Butler, 1996).

A further development of the TOS is the Ecotourism Opportunity Spectrum (ECOS). The model has eight factors considered as significant for ecotourism including access, compatibility between ecotourists and other users in the area, attractions and infrastructure, skills and knowledge requirements, social interaction and type of management or control needed. These factors are further divided according to the ecotourism type, ranging from the "harder" to the "softer" ecotourist (Boyd & Butler, 1998).

A more detailed and complex management approach towards sustainable use of protected areas is the Limits of Acceptable Change (LAC) planning system. LAC aims to identify acceptable and achievable resource and social conditions. It is a planning system that is adaptable and based on an issue to issue strategy to be used as a supportive tool or framework for protected areas and nature tourism. The LAC is divided into nine steps: Identify areas' special values, issues and concerns; identify and describe recreational opportunity classes; select indicators of resource and social conditions; inventory existing resource and social conditions; specify standards for resource and social conditions for each opportunity class; identify alternative opportunity class allocations; identify management actions for each alternative; evaluate and select a preferred alternative; and implement action and monitor conditions. LAC realises the complexity of issues within natural area management, but provides for a technique to manage an area issue by issue and according to its class of the opportunity spectrum and its special features needs (Borrie *et al.*, 1998).

Integrated and holistic sustainable marine tourism management is essential for the ecological sustainability of a marine nature resource. One of the most popular tools and models for recreational and tourism activities is the Recreation Opportunity Spectrum (ROS) as described above. The model divides recreational and tourism resources or areas into different classes based on criteria such as accessibility and type of activities available. Orams (1999) presents a more detailed version of the ROS, applicable specifically for marine tourism activities. The model is called the Spectrum of Marine Recreational Opportunities (SMRO). The SMRO (see Table 3.2.) has five classes with

four describing characteristics. The main difference between the five classes is their accessibility, physical situation and closeness to the shoreline. The first class is very easily accessible and on land, such as sunbathing on a beach or having lunch in a beach restaurant ranging to the fifth class which is remote, uninhabited areas over 50 km off-shore. The four categories are experience, environment, locations and example of activities (Orams, 1999). The significance of the SMRO is found in its presentation of marine activities as "*a range of different activities* available for *a range of different users, giving different tourists and local recreational users the chance to participate in a range of activities based on various needs and interests*" (Orams, 1999, pp. 45).

Table 3.2. The Spectrum of Marine Recreation Opportunities (Orams, 1999, pp. 45)

Characteristics	*Class I* *Easy accessible*	*Class II* *Accessible*	*Class III* *Less accessible*	*Class VI* *Semi-remote*	*Class V* *Remote*
Experience	Much social interaction with others High degree of services and support Usually crowded	Often contact with others	Some contact with others	Peace and quiet, close to nature Safety-rescue available Occasional contact with others	Solitude Tranquillity Closeness to nature Self-sufficiency
Environment	Many human influences and structures Lower-quality natural environment	Human structures/ influences visible and close by	Few human structures close by-some visible	Evidence of some human activity, e.g. lights on shore, mooring buoys	Isolated High-quality Few human structures/ influences
Locations	Close to or in urban areas Beaches and intertidal areas	Intertidal to 100 m offshore	100 m offshore to 1km offshore	Isolated coasts 1-50 km offshore	Uninhabited coastal areas >50 km offshore
Example of activities	Sunbathing People watching Swimming Playing games Eating Sightseeing	Swimming Snorkelling Fishing Jet-skiing Surfing Para-sailing Windsurfing	Usually boat-based Sailing Fishing Snorkelling Scuba diving	Some scuba diving Submarining Power boat Larger sailboats	Offshore sailing Liveaboard offshore fishing Remote coast sea-kayaking
Intensity of use Human impact	←			→	

For the purpose of this study of Protea Banks, the fourth class is of interest. These types of marine activities are classed as semi-remote, with closeness to nature and limited contact with a certain group of participating recreational users and tourists. However, it is important to realise that even though the main marine activities occur 8 km offshore, there are significant components of the pre- and post- activities occurring on land. These activities include boat preparation and launching, preparation of equipment and marketing and administration of the marine tourism activities. Accommodation and catering are other elements of the total tourism product which are important to consider in association with the marine tourist even though the main activity might happen 8 km offshore.

The management of marine tourism has to be considered in relations to the activity of a particular area. The management strategies need to refer to which activities are taking place within the area and how much pressure tourism imposes on the ecosystem. Traditional tourism planning and management focus on terrestrial areas and many of these strategies do not apply to marine areas. Management strategies also need to cover socio-economic aspects in addition to the ecological characteristics of an area in order to fit into the political pattern of policies and development planning. A problem with tourism and marine tourism management is that the authorities' or the government's views and responses to tourism management is often ad hoc and fragmented rather than a more preferable integrated and preventative strategy. A mix of different management tools adapted to a specific area is usually a preferable option for marine tourism management. Regulatory management instruments include laws, permits, codes of conduct, taxes and incentives. Potential voluntary management measures include providing information and raising public awareness and supporting NGOs and other local organisations. The government can support local marine tourism by financing tourism developments, creating public-private partnerships or establishing public tourism enterprises which are later sold or passed over to private ownership. The national government of a country with marine tourism is significant in the promotion of the nation's tourism products and much controls the image of a country as a tourism destination (Hall, 2001).

The government plays a very important role in the long-term management, monitoring and evaluation of marine areas with tourism users. The White Paper for Sustainable Coastal Development for South Africa (DEAT, 2000) calls for a monitoring program for the state of the coastal areas, and its management. This task is conducted by the CSIR Division of Water, Environment and Forestry Technology on behalf of the Department of Environmental Affairs and Tourism. The CSIR has developed a set of coastal indicators for the purpose of monitoring coastal areas. The development of the indicators has happened with stakeholder consultancy and participation (CSIR, 2004). Indicators provide an understandable approach to more complex trends in the environment. Indictors are used to define the nature and size of problems, and to assist management in finding solutions. Indicators can also be used for tracking the process of successful coastal management (Pickaver *et al.*, 2004).

Many of the indicators cover issues related to marine tourism activities and developments. One of the indicators measures a selection of fish species caught by commercial and recreational fishermen, another measures the seasonal tourism pressure in coastal areas by the monthly number of beds occupied per province in selected locations. Four indicators measure public awareness, empowerment and participation. One of these indicators is the number of school groups visiting aquariums and the budget allocated to public education and awareness of the coastal environment. Other indicators look at water quality, species diversity, pollution, change of land use, coastal development, the value of the coast and coastal governance. The most tourism specific indicator is number 13 which measures (CSIR, 2005, pp. 14):
"*The total number of Blue Flag Beaches per year, as a percentage of the number of major beaches in South Africa*".

Blue Flag Beaches are awarded to areas which are committed to sustainable coastal management. In order to be credited as a Blue Flag beach 14 strict criteria must be met. The criteria cover management which includes coordination of activities, provision of facilities and cleaning of the beach area. Water quality standards cover four of the criteria. Safety issues are listed under the three criteria of providing lifeguards on the

beach, provision of certain infrastructure and patrolling of the beach area. The final criteria concerns information and education. A Blue Flag Beach should be a source of coastal education and awareness, promoting educational activities and implementing the objectives of the National Coastal Policy. Finally, the beach must have a system of constant monitoring and control of the beach area and its environment (CSIR, 2005). It might be interesting to produce a separate state of coastal tourism in South Africa, including its impacts, effects and management in order to better understand marine tourism and improve potential managerial aspects and also mitigate negative ecological impacts. However, such a complex exercise might prove an economical challenge.

Marine tourism management strategies usually work best if there is a combination of various physical, regulatory, economic and educational strategies depending on the specific management needs of a site or area. The purpose of management is not only to protect the environment, but to make the area safe for its recreational and tourism users. Physical barriers are a commonly used control strategy in terrestrial management, but do not apply in the same manner for marine areas. The most common type of a physical management strategy in association with marine tourism is, for example, the creation of board walks to prevent erosion on beaches. An off-shore example of physical management instalments is mooring buoys for dive vessels in coral reef areas in order to prevent anchor damage and also to a certain extent to control who uses the site and when. Regulatory management strategies are the most traditional ways of marine management with prohibition of certain activities, limitations on numbers of people, time restrictions, closed areas, requirement of minimum skill level and zoning according to activities allowed in each part of the area. Economic management strategies are usually based on fines and fees. Educational management strategies can be presented and used in a variety of different techniques. Information boards, signs, information centres, guides, written information in various forms and speciality courses to mention some (Orams, 1999).

3.3. Marine tourism and SCUBA diving

According to Orams (1999), one of the most significant interventions regarding marine tourism is the creation and use of SCUBA (self-contained underwater breathing apparatus). SCUBA diving has over the years contributed to a change in view of the marine environment. Recreational diving has become a multi-billion dollar industry and many tourism destinations have diving as their main attraction. More importantly, diving changes the way people look at the ocean and marine ecosystems. The ocean changes from being a mysterious mass of water hiding strange plants and animals, to being a reachable open living space available to observe and learn from. Additionally, diving is a physical, exciting and challenging recreational activity (Orams, 1999).

Interest in diving is said to be growing at an exceptional rate. The biggest international diving company (PADI) certify over 600 000 divers annually (Anderson, 2002). In Australia over 100 000 divers are certified each year (including international tourists) (Davis & Tisdell, 1995), and in the USA there are supposed to be between four and five million certified divers (West, 1990 in Orams, 1999). However, it is difficult to estimate the precise number of divers as there are several dive institutions and many resort divers (non-certified divers). Additionally it is impossible to account for the total number of dives at any place as these include non-commercial dives (Davis & Tisdell, 1995).

According to Davis and Tisdell (1995), the reasons why people dive include an interest in marine ecology, desire for a wilderness experience and underwater photography. Additionally, diving is considered by many as an adventurous sport with certain possibly exciting risks involved. Traditionally diving is not considered as a mainstream sport, thus adding an image of uniqueness and being special. However, the number of divers globally is increasing and diving is becoming more accessible both in terms of technical innovations and improvements, economic issues (cheaper dive packages, competition and resort dives), geographical access (liveaboards and advanced boats) and an increasing number of dive centres.

Marine tourists in association with risk and adventure activities, such as surfing, sailing and SCUBA, are often dominated by (younger) males. The average marine tourist is from an upper socio-economic level of society, due to cost of different equipment, such as boats, diving equipment and surfboards (Orams, 1999).

Diving can include a certain risk. Deep diving increases the potential chances of getting decompression sickness and air embolism. Strong currents can disorientate the diver or be exhausting. This can lead to stress or panic and dangerous situations. But, usually if the dive is well planned, the diver has the needed experience and is in relatively good physical shape, the equipment is working and common sense is used, the dive will go well even under challenging conditions (PADI, 1988). Aquatic animals usually do not harm or bite divers if not provoked or touched. If, however, this should happen the major problem is to stop the blood loss and try to keep the hurt diver breathing normally and not go into shock due to loss of oxygen (PADI, 2001).

3.3.1. Marine wildlife and human interaction

Diver-interaction between humans and marine life has assisted in marine research, but also become a popular tourist activity. Interaction with wild animals in their natural environment is for many more attractive and exciting than visiting an ocenarium/aquarium which is a man-made setting with captive animals (Orams, 1999). One of the foremost interests of recreational divers is to observe large marine animals. Sharks tend to fascinate all levels of divers (Duffy, 2002; Anderson, 2002). Duffy (2002) experienced during her research of ecotourists in Belize that most divers were most excited about seeing larger marine animals and wrecks. She describes this desire of the dive tourists as equivalent to "The African Big Five". In order to satisfy the dive ecotourists, the tourism industry provides easy access to certain dive sites with spectacular marine life such as Shark Alley with a high possibility of viewing sharks and rays. While interaction with marine animals such as sharks can, and from an ecotouristic perspective should, lead to a greater awareness of the animals and their habitats, this does not necessarily always happen. Dive operators conducting dives at Shark Alley have expressed concern about divers harassing the sharks, holding on to their fins while having

their photo taken. The continuous feeding of the sharks by dive operators in order to satisfy the dive tourists is believed to modify the sharks behaviour into acting in a more aggressive way than normal (Duffy, 2002). Interpretation is a very valuable and imperative tool for successful interaction between humans and marine animals. Collaborations between researchers and tourist operators can enhance both the tourist's experience and help to raise awareness and understanding of the marine ecosystems, in addition to education and information about the importance of protecting marine areas. Examples of such collaborations include dolphin watching in Port Phillip Bay (Wearing & Neil, 1999) and swimming with whales programmes in the Great Barrier Reef (Valentine *et al.*, 2004).

Ecotourism is considered a sustainable non-consumptive utilisation of nature for recreational purposes. One of the factors deciding whether an ecotourism activity is successful or not is the impacts it has on wildlife. A case study concerning the behavioural responses of fur seals in association with marine tourists suggests that negative impacts are avoidable with a set of minimal management strategies. The study showed two main tourist behaviours causing the seals to either retreat or behave as if attacked if the tourists came closer than 10 meters or if they did not behave in a calm way. The study suggests that some of the imperative management strategies for minimising impacts on wildlife from ecotourism are to regulate and control the distance between the animals and the tourists, and the tourists' behaviour. The tourists' behaviour can be controlled by informing them and guiding their attitudes by raising behavioural awareness (Cassini, 2001).

The most internationally known marine tourism activity in South Africa is cage diving with Great White Sharks in the Western Cape which has been made famous through documentaries by BBC, National Geographic and the Discovery Channel. Commercial Great White shark cage diving has been arranged since 1992 in South Africa. The main market for White Shark cage diving is the international market and some domestic tourists from Gauteng. These market segments are considered to have a higher financial income and can thus afford the rather costly shark experience. The cage diving is a

unique experience and the customers are willing to pay a high cost in order to experience it. The actual dive takes place in a submerged cage off a boat with usually two divers in the cage at a time. Dive certification is usually required. The sharks are attracted by baits made of various fish substance. Around 20% of the shark viewing is done from onboard the boat, with good visibility and safe platforms to watch the sharks from. The cage diving boats collaborate and support each other as this is considered as a benefit for all the parties involved. They share sighting data and real time sightings. Many of the boats also have scientific researchers onboard which contributes not only to the research, but also as interpretation for the tourists. Reports of shark encounters are forwarded to the Marine and Coastal Management Department in Cape Town which is the responsible authority for the shark tourism. The operators need a permit from Marine and Coastal Management and have to follow a Code of Conduct.

Most of the tourists have a perception of the Great White affected by the famous "Jaws" movies before the shark viewing experience, but the shark diving tourism industry claims that this view point is changed to one of a need for conservation and respect for the sharks after just one day on the shark viewing boats (Mannix, 2004). However, there are several environmental concerns expressed from various parties about the potentially negative effects on the Great White Sharks as a species due to the popular and increasing cage-diving industry. One of the most discussed concerns is linked with conditioning the sharks by feeding or chumming, and the increase in Great White Shark attacks in the Cape area of South Africa the last few years (Sadie, 2005) . *"Conditioning is a type of learning in which the instinctive reflex actions of an animal in response to a given stimulus area altered as a result of the experience of the animal"* (Sadie, 2005, pp. D). Conditioning of the Great White Shark is at the least theoretically possible, but conditioning must be considered in a list of aspects including frequency of contact between a specific shark and a cage-diving operator, whether the shark actually gets and eats the bait and how long it stays around the boat to mention some. The increase in Great White Shark attacks on humans increased previous to the start of commercial cage-diving and the number of attacks seems to fluctuate without direct correlation with cage-diving operation (Sadie, 2005). However, one might ask whether it is ethical or ecologically

sustainable to feed and attract a protected marine apex predator, and if it is really a true ecotourism experience. Even though ecotourism will never mean no-impact, but rather less negative impact than regular tourism, it is difficult to establish a limit between acceptable and unacceptable tourism practises. Does protection of a species mean just that it should not be killed, or should the protection also include other aspects such as prohibition of stressing, hurting or otherwise disturbing the sharks?

The cage-diving industry has been accused of habituating Great White Sharks to human-beings and boats, due to the sharks association of bait with the electrical fields of people. Additionally, one cage diving operator claims he has attracted over 5 000 sharks for the purpose of cage-diving. The sharks are migratory, but stay in localised areas over time. The number of Great Whites in this particular area is suggested to be around 500, implying that the majority of the attracted sharks will be return visitors to the dive boats (Ashton, 2004).

"*Like lions or leopards white sharks are potentially dangerous under certain circumstances, but they are nothing like the vicious, man-eating monsters often depicted in the press*" (Sadie, 2005). How is it then that the feeding of lions, baboons and other terrestrial animals is not recommended due to safety issues and potentially habituating the animals, whilst shark feeding is allowed?

Another type of shark feeding occurs between Protea Banks and the MPA Aliwal Shoal. Two operators conduct Tiger Shark diving where baiting is used to attract sharks. The dives are open water or big blue dives without cages. The Tiger sharks are not believed to be local but rather migratory, thus not conditioned by the baiting. There is, however another concern; that of the divers' safety. Tiger Sharks can grow to the size of over 4 meters (Bass *et al.*, 1975). In a feeding frenzy, even though not purposely attacking a diver, accidents can potentially happen. However, no accidents have been reported so far (ref. Anonymous). The shark diving operators at Protea Banks do not practise any form of feeding or chumming to attract sharks, but rather promote the experience of viewing sharks in their natural habitat without disturbing or harassing them.

3.4. Marine tourism and recreational fishing

Another group of marine recreational users and tourists who are interested in sharks are the recreational fishermen, but the continual fishing of sharks has also led to their decline. However, in recent years in some countries recreational fishing has been revised with the implementation of tag and release programs. These programs are becoming more common, killing fewer sharks and potentially assisting in scientific research. Recreational fishing of sharks might only consist of a small percentage of the total commercial elasmobranch fisheries, but shallower coastal areas in which recreational as opposed to commercial fishing occurs, are assumed to have a more fragile ecosystem concerning extraction of the shark as the apex predator (Anderson, 2002). South Africa has long a history of sport shark fishing. The east coast was and still is a popular area for spearfishing (Condon, 1971).

Recreational fishing is a popular activity in many countries including the USA. The peak of registered sharks caught by recreational fishermen was reached in 1974-75 with 1,588,000 sharks in the Atlantic Ocean and Gulf of Mexico. However, catches have decreased significantly ever since. But, shark fishing is still very popular mainly due to its accessibility as different shark species can be caught practically everywhere from the shore to open water areas (Stone *et al.*, 1998).

3.5. Marine conservation and tourism

Tourism depends on the environment (Wong, 1993). One of the most important factors for commercial SCUBA diving is the environment in which this activity takes place. Dive sites are often based around a reef with a high abundance of marine life. Maintaining the pristine state of the ocean ecosystem is imperative for maintaining the dive tourism it attracts. Conservation strategies need to be implemented for the benefit of both the commercial dive industry and the marine ecosystems. This conservation can also indirectly also benefit fishermen in close proximity to these areas as fish abundance is likely to increase over time. The establishment of Marine parks or Marine Protected Areas seem to attract dive tourists, but can also be a threat to the marine environment if not managed in an ecologically sustainable manner. (Tratalos & Austin, 2001; Schleyer

& Celliers, 2005). There are several examples of experienced divers being concerned about novice divers and the negative effect they have on the natural marine environment, through for example standing on and breaking coral due to the lack of buoyancy control. High number of divers regardless of their certification can also scare marine life and either disturb their natural feeding or other behavioural patterns, or at worst scare them away totally from the area (Duffy, 2002).

Diver concern for the state of the marine environment is far from a new subject. Vallintine (1971, pp.41) describes humankind's use of the ocean as "a bottomless rubbish dump". He also criticised other divers in places such as the Mediterranean for helping themselves to cultural artefacts as if it was "a free antique supermarket". Dive tourists are said to be willing to pay more for a dive experience in pristine and attractive environments, especially if the dive site is within a protected area (Davis & Tisdell, 1995).

3.5.1. Nature conservation and the marine environment

Nature conservation is in general conducted in a very utilitarian manner, based on the value of nature as a resource for human use. The IUCN (1980, pp.8) states that the management of the human use of nature is necessary in order to ensure sustainability, so these resources can be available for future generations as well as the present, not only for the purpose of protecting nature in itself. Conservation is seen as positive as it is beneficial to humans over time and generations. But, how should the species which are not of direct use to the human population be managed? Opposing the utilitarian view of nature as a set of resources is the view that nature is a value in itself (intrinsic right to exist) and that we as the dominant species on Earth have an immense responsibility towards all other life and species. This point of environmental view links to what is called deep ecology. However, deep ecology is seen by many as an impossible environmental philosophy as much of the most severe nature degradation takes place in poorer communities where nature is needed as a resource for humans in order to just survive (Jackson, 1992).

Reasoning for conservation can in many situations be a complicated task. Compromising between differing opinions in order to achieve a solution is often needed. Additionally collaboration between very different user groups for the purpose of increased knowledge and awareness of a particular subject is often needed in order to enhance the possibilities for nature conservation in an area (Stebbins, 1992). There is really no compensation for extinction of species and neither is it easy to predict that the lack of some sort of conservation might lead to this outcome. It is not easy to argue for something that might just happen in the future, due maybe to some sort of short-term project or relatively low scale action at present, but with potential negative impacts which might just be visible many years from now. Actions generating economic benefits tomorrow might have the opposite impact further into the future, but many of these cases are very difficult to argue for or prove (Stebbins, 1992).

Increasing global concern for loss of biodiversity has grown over the past two decades thus leading to the realisation for greater conservation practices. Terrestrial and marine environments require different conservation management strategies. Both environments are experiencing different ranges of degradation as a direct impact from human use. The need for sustainable management of the marine and coastal environments is increasingly internationally recognised, but is not easily achieved as the knowledge of the oceanic environment is limited in comparison to the terrestrial environment. Marine conservation strategies need to be identified on an international level, but the direct actions and implementations to protect the environments should to take place on a local level depending on an area's features and specific needs (Thorne-Miller & Catena, 1991).

The protection of ecosystems and their species depend on the action and attitudes of humans, and the willingness to agree with the fact that everything on Earth is interconnected. A very small area (around 3%) of Earth is protected, and these areas are often small, fragmented and isolated from each other, surrounded by non-protected areas. This fact is especially problematic for marine nature reserves, as these are not fenced in and not easy to monitor. The future of many aquatic species might depend on preservation and the protection of areas and species (Moyle & Leidy, 1992).

Natural area management is a complex task involving a range of various stakeholders from managing authorities to local user groups. Sustainable management aims and objectives for the natural areas needs consensus among all stakeholders and interested parties, ensuring both a spectrum of user opportunities and minimising negative environmental impacts. It is imperative to realise that the management of a natural area is more about managing and controlling the human use of this area and its resources. (Borrie *et al.*, 1998).

Some of the most common conservation management strategies are the establishment of marine protected areas and regulation of specific species (Thorne-Miller & Catena, 1991). South Africa's coastal zone is relatively unspoilt. However, human usage of natural resources is generally increasing and appropriate management strategies need to be implemented in order to reverse existing degradation and avoid future negative impacts on the marine environment. The declaration of marine protected areas (MPAs) can support sustainable marine management and conservation, but unfortunately many MPAs are not properly managed and the declaration itself does not directly benefit the marine environment. MPAs need to be productively and effectively managed in order to be successful (Robinson & Graaff, 1994).

Loss of biodiversity in aquatic systems has mainly been focussed on freshwater ecosystems, rivers and estuaries where the highest diversity of species is believed to be found. However, loss of aquatic biodiversity is spreading seawards, and especially the shallower coastal areas are of concern. The ocean has for long been considered as a waste sink, and the pressure is increasing with a growing population and further development of coastal areas (Moyle & Leidy, 1992).

Biodiversity is often used as a key for conservation, but it is important to realise that this criterion must be evaluated together with other measures. Coral reefs, for example, are very diverse, while sea grass beds and mangroves would have a low score on the diversity rankings, yet are imperative for certain ecosystems and associated animals to survive. Another vital issue is the over-exploitation of certain species potentially leading

to local extinction of vulnerable species. In these specific cases the challenge is to investigate why the over-exploitation is happening and to relate the appropriate approaches to solve the problem. Marine protected areas can be a tool for addressing issues such as marine ecosystem degradation and threatened species (Robinson, 1995).

There is a general lack of scientific evidence evaluating the decreases in marine fish populations, but in several areas commercial fisheries are noticing declines in catches to the point where the industry almost stops being economically viable. Over-fishing of one species might affect a whole ecosystem, but little is known as to actually how. There are many uncertainties concerning global, regional and local fish stocks, but one aspect is fairly clear; the biggest threat to marine biodiversity is humans, our activities and population growth (Moyle & Leidy, 1992). There is an increasing concern about both recreational and commercial shark fishing and its potential effects on marine food webs (Mauire and Gruber, 1990 in Moyle & Leidy, 1992).

3.6. Marine Protected Areas

The majority of Marine Protected Areas globally are in connection with shallow waters such as coral reefs. These are of interest for SCUBA divers in addition to potentially generating economic income from for the local area from dive operators and other tourism related activities. Another significant fact is that these protected areas provide places for larger marine animals (such as sharks) to be viewed by paying dive tourists. The biggest and maybe also most famous marine park is The Great Barrier Reef (GBR) in Australia (Orams, 1999; Moyle & Leidy, 1992). The GBR stretches 2,000 km along the north east coast of Australia, with around 900 islands and 2,900 unconnected coral reefs. Marine tourism in the GBR started as early as the 1890s and is today the largest commercial activity in the area. The GBR was declared a World Heritage area in 1981, the largest ever established. Following this declaration it has an international responsibility towards protection and conservation. Marine tourism generates over $1 billion annually and is contributing both directly and indirectly to the local and national economy (Skeat, 2003).

Until recently less than 5% of the Great Barrier Reef Marine Park (GBRMP) were actual no-take areas, but this was expanded to 33.3% in July 2004 (Sale *et al.*, 2005). Over 1.6 million tourists visit the area every year, and there are around 730 permitted tourism operators of which 60% are actively operating (Skeat, 2003). The tourists pay an Environmental Management Charge (EMC) of AU$ 4 per person per day (David & Gartside, 2001). The main activities are SCUBA diving, snorkelling, recreational fishing, glass-bottom boat trips, sailing and learning about the marine environment. The tourism industry has a great responsibility for educating the tourists about sustainability and minimising the visitors' environmental impacts (Skeat, 2003).

The GBR is mainly managed by the Great Barrier Reef Marine Park Authority (GBRPA), in collaboration with Queensland Parks and Wildlife Service and other authorities and stakeholders under the national and regional government. The collaborative management aims to facilitate for providing positive and educational visitor experiences of the GBR through wise use and protective management. One of the objectives is to reduce conflicts between the different user groups and encourage the use of best practises and sustainable code of conducts. One of the most important environmental management tools used in the GBR is zoning. The Great Barrier Reef Marine Park is divided into zones based on the activities conducted and allowed in the different zones. The majority of commercial and also some non-commercial activities require permits from the GBRMPA. Collaboration between the authorities and the tourism operators is seen as very important for the GBR's marine tourism long term sustainability. Additionally, marine tourism is considered as a valuable opportunity to inform the marine tourists about the marine environment and its conservation needs. Marine tourism in the GBR contributes to raising general public awareness about marine ecosystems and the need for its protection and its intrinsic value (Skeat, 2003).

Many of the areas within the GBR have site specific management plans for each area's specific needs. A dive site well-known for its population of big potato cods received over 30,000 divers annually. Fishing in this area was restricted in order to protect the resident fish. Other site specific management measures were suggested and later introduced by the

dive operators themselves. They formed a reef operator association and in collaboration with the GBRMPA the operators are now partly self-regulated. Regulations include boat size, the amount of time spent per operator per reef and fish feeding (Orams, 1999). Dive tourism operators can apply for permits for feeding certain marine species such as the Potato Cod at the famous dive site Cod hole. Shark baiting (not feeding) occur in the Coral Sea, outside the GBR. Shark baiting (chumming) is conducted in one specific area. Fish bait in a small cage box is lowered down a mooring line to a fixed mooring on one of the reefs (Osprey Reef). The dive tourists gather around this area to experience the huge number of different sharks being attracted to the bait box (ref. personal observation, 2003).

Marine protected areas are often lobbied or spoken for by conservationists representing non-governmental organisations (NGOs). The NGOs are in many cases a link between scientific or academic communities, the authorities and the public. While the authorities focus on fisheries is to harvest the highest amount of fishing yields, the conservationists have a more ecosystem-based approach. NGOs also tend to focus on the precautionary approach, often mentioned under sustainability strategies, meaning in situations of uncertainty as to whether an action is ecologically sustainable or not, rather not conduct the considered action as a preventative measure (Agardy, 2000).

The use of marine protected areas as a management strategy aims beyond the species-to-species point of view, and aspires to conserve ecosystems as a whole including all their inhabitants and services. However, it is not possible to fence in marine species, as it is with terrestrial areas and animals, and a combination of international conservation management is necessary in order to be effective (Agardy, 2000).

Sale *et al.* (2005) identify several gaps in the scientific ecological knowledge concerning no-take marine areas. First of all there needs to be an acknowledgement of the need for further facts and data, followed by close collaboration between specialised marine scientists and the authorities. Detailed scientific background data is needed in order to establish MPAs in the most crucial geographical sites, in addition to understanding the

size needed for each area depending on the movement of the different species with protection needs. For long distance migratory species MPA protection alone would not be sufficient as a conservation strategy. Studies of marine ecosystems need to persist on a long-term basis in order to be useful and provide reliable and useful data. The different governments need to provide funds for marine research.

According to David & Gartside (2001), marine natural resources are exceptionally valuable, and renewable if managed in a sustainable manner. However, sustainable marine management is rather rare, and there are many examples of overexploitation by both the fishing industry, polluters and tourism operators. The economic aspects of marine resource management are traditionally regulatory; "demand-and-control" (David & Gartside, 2001, pp.224), meaning the authorities legislation or set standards relating to, for example, user behaviour and use of fishing equipment. Economists argue that a market-based incentive approach would be a more appropriate marine management strategy. This approach includes assimilation of different monetary values on marine resources through, for example, tax, prices or rights of use or access. But, how to set the correct price on a marine resource, and what is the intrinsic value of a marine area? Marine resources are often under-valued as a result of the difficulty of setting a monetary value on a natural resource, and consequently overused. The majority of marine areas have open access to all as they are the property of the state and people, managed by the authorities or governmental agencies. The main problem of this regulatory management approach is that the financial and social cost of the enforcement of the legislation and regulation is too high and therefore not efficiently conducted, leading to degradation. Marine management often lead to trade-offs between economic effectiveness and ecological or social outcomes. The issue of equity and equal right to use and access to a marine area are highly affected by environmental management and economics. Those with the least opportunity to pay for the use of a marine resource are the first to lose out when regulations are put in place (David & Gartside, 2001). The issue of fairness and environmental justice in South Africa is a difficult and complex problem resulting from the long history of apartheid and unfair distribution of resources, human rights and education to mention some (Scott & Oelofse, 2005). The issue of marine conservation

therefore becomes even more sensitive and compound in a social aspect, as political fairness at present time must compensate for the extreme number of political crimes conducted in the past.

Marine protected areas can be important for protecting certain species feeding and breeding habitats, promoting awareness through increasing public awareness and providing for marine ecotourism experiences, thus providing financial income. Additionally, marine protected areas are crucial for scientific research. Management of the marine environment needs continuous studies as it is a constant process of change, improvement and adaptation (Agardy, 2000). The establishments and management of marine protected areas must include all the relevant stakeholders with a close collaboration between scientists, local fishing community, authorities and other marine user groups in the area. Additionally, it is important to keep all the involved and affected stakeholders informed in a transparent manner concerning the MPA and for the authorities to provide for monitoring and enforcement. In areas where local communities and their livelihood is directly affected, the authorities should be responsible for providing alternative income options to maintain or improve the citizens' quality of life (Sale *et al.*, 2005).

3.6.1. Marine Protected Areas in South Africa

There used to be three main areas of marine protection in South Africa: De Hoop Marine Reserve in the southern Cape, the Tsitsikamma National Park further east and the St. Lucia and Maputuland Marine Reserves on the north-east coast (Turpie *et al.*, 2000). Five new MPAs were established in 2005 and South Africa now has a total of 19 MPAs. The new areas include Bird Island Marine and Namaqualand Reserves which are absolute "no-take" zones. Pondoland Marine Protected Area is now the largest MPA in South Africa covering 90 km of coastline and 15 km seaward. Together with newly declared Aliwal Shoal MPA and Cape Peninsula Marine Reserve, Pondoland has a combination of "no-take" and "controlled" areas (WWF, 2005; MCM, 2005a).

South Africa has at present protected around 18-20% of its marine areas. The main aim is to protect biodiversity and to protect from over-fishing (MCM, 2005a). Additionally, the MPAs are considered as significant in protecting important areas and habitats for important steps in different fish life cycles, thus boosting the overall fishing in South African waters (DEAT, 2005c). The national goal is a minimum of 20% as stated in the World Parks Congress held in Durban in 2004. The responsibility of managing the MPAs is a joint collaboration between Marine and Coastal Management under the national government, South African National Parks and Ezemvelo KwaZulu-Natal Wildlife (MCM, 2005a). The protection of biodiversity is considered as imperative in association with the establishment of MPAs. However, MPAs are also an important tool for the development and controlling of economic benefits from commercial activities, mainly SCUBA diving. Such areas include Aliwal Shoal, Cape Peninsula and Pondoland MPAs (DEAT, 2005c).

Ezemvelo KwaZulu-Natal Wildlife (EKZNW) is the responsible organisation, thus authority of the management of nature conservation and development of ecotourism in KwaZulu-Natal (KZN). They are responsible for the over 400 km long coastline of the region, including both protected and non-protected areas. A study by World Wildlife Foundation (WWF) (Lemm & Attwood, 2003) on the state of MPAs in South Africa suggest that EKZNW should "attempt to secure additional field staff" and "encourage their staff to participate in MPA training courses, and other marine skills such as skippering and diving" (Lemm & Attwood, 2003. pp.17). Further suggestions concern the need for more enforcement and policing with more frequent controls and access point checks. Other comments on marine protected area management in South Africa included need for better communication between the national and regional authorities, lack of knowledge about the legislation, need for further public involvement in marine management and better monitoring systems. The study also suggests that Ragged Tooth sharks should be fully protected, not only from commercial fishing, the reasoning being the popularity of the sharks by dive tourists (Lemm & Attwood, 2003).

3.6.2. User conflicts and marine areas

Many MPAs attract tourists such as SCUBA divers and fishermen, which automatically create user conflicts due to different interests. Different management tools such as zoning have in many cases solved or at least reduced these disputes (Salm *et al.*, 2000). The rights of a user group in a marine area often become a case of property rights and access privileges to the marine resources. Regulations can be established for the different user groups and can include open access to a specific group (for example non-consumptive divers) while restricting others (such as recreational fishermen). Limited entry approaches can also apply to different operators within the same segment. An example is different dive operators with different allocated reefs or time restrictions at each dive site (David & Gartside, 2001).

Conflict between different user groups or stakeholders is a common phenomenon in marine areas, but maybe specifically in connection with MPAs which usually include specific regulations and rearranging the previous use of the area. One of the main reasons for the development of conflict is by lack of involvement by all the relevant stakeholders and people who use or care for the marine area. The issue of having a transparent decision-making process involving all the relevant stakeholders in an MPA is considered as the basic necessity for its success. The various user groups will have different needs, and communication is seen as the key for understanding, dialog, joint problem solving and resolution. Conflict is not necessarily just negative, but can be the beginning of recognising problems in the marine area and initiating a process of solving the difficulties. However, conflicts can also become destructive leading to hostility amongst the different direct stakeholders (Lewis, 1996).

Lewis (1996) lists three main principles for solving conflicts in protected areas. The first is to *focus on the underlying interest* of the stakeholders. The interest of a stakeholder means his or her needs and concerns. This term is often confused with the word position. Position relates to the stakeholders' suggestions on how to satisfy their interest. The interest of, for example, protecting a species of fish can be represented by a range of different stakeholders with different positions. If the focus is directly on the stakeholder's

interest, the desired outcome of a decision-making process might be easier to reach and it might be easier to both understand and satisfy more user groups. However, it is not common to end up with a outcome that all the stakeholders are fully satisfied with. Usually some sort of compromises has to be made in order to reach some sort of partial and fair win-win situation.

The second principle of conflict management is to *involve all significantly affected stakeholders in a fair and respectful process*. People want to be involved in the decision-making concerning areas they use or care about. The lack of involving stakeholders in the process of establishing protected areas has resulted in frustration amongst the stakeholders and various conflicts have arisen. If the stakeholders are involved from the beginning of a project of, for example, establishing a MPA, they are more likely to support the project and contribute with their own knowledge of the area. Inclusion also provides people with a sense of ownership and guides towards stewardship. The third principle is to *understand the power that various stakeholders have, and take that into account when trying to resolve a conflict.* Power is critical in solving a conflict. Different stakeholders will relate differently to a decision-making process or conflict solving procedure relating to their background and perceived level of power. There exist a range of different powers; power of authority, knowledge, personality, economic and political to mention some (Lewis, 1996).

Conflicts over natural areas will necessarily differ greatly depending on the specific site in which the conflict plays out. A conflict solving process or the process of establishing a nature protected area is similar to the process of Environmental Impact Assessment (EIA). The first step in a conflict solving process is to establish the different roles of the participants. Secondly, there would have to be an assessment the conflict, establish who it includes, in addition to gathering other relevant information. Thirdly, the relevant stakeholders would need to be involved in the process of negotiation and solutions. It is imperative to involve all the stakeholders, not only the ones who speak loudest, and some stakeholders might need some assistance or representatives to embody their point of view. It is of significance to meet some of the needs of all the stakeholders in order to

represent a fair balance of decisions. Finally, the outcome of the conflict needs to be implemented and evaluated (Lewis, 1996).

The above described framework for solving conflicts in a natural region relates to protected areas. However, the same principles could be applied to, for example, a marine area, protected or not, in the case of conflicts such as conservation versus consumption of resources.

4. METHODOLOGY

Science (including social science) is the construction of truth using scientific method. Scientific research can be said to be the scientific method of requiring knowledge; a systematic investigation of questions, settings or problems using a certain set of principles. The selection of a research topic is most commonly done by either continuing previous research or exploring a theory or model. A third background for selecting a research topic, and the one used for this study is the observation of reality. The study can be explained as an exploratory and descriptive study, finding out the opinions of people towards particular issues at one particular time (Bless & Higson-Smith, 1995).

This study aims to produce a set of site specific marine management plan recommendations with a marine ecotourism approach for Protea Banks based on stakeholder opinions. In order to obtain this goal, the stakeholders' opinions needed to be consulted and registered. The data then needs further organisation and analysis, in order to be presented.

The objectives of the study are firstly to identify the user groups at Protea Banks and their utilisation of the reef. Secondly, to register the stakeholders' views of Protea Banks as a marine tourism resource, and its management issues with special regard to user conflicts. Thirdly, to investigate stakeholders opinions concerning shark management and conservation. The final objective of the study concerns the stakeholders' opinion of the potential establishment of a Marine Protected Area (MPA) in association with Protea Banks.

4.1. Qualitative methods

Qualitative analysis is by some regarded as an art rather than a science, as qualitative research and analysis as opposed to quantitative research is less positivistic and requires minimum forms of measurement techniques (Kitchen & Tate, 2000). Maykut and Morehouse (1994) describe qualitative research as using a human (the researcher) as the

main instrument for data collection and analysis. One of the main aims becomes to remain objective and neutral in both the collection of data and its analysis.

The main objects for qualitative research are human experiences and situations. Qualitative research can be described as reading of or attempting to understand a situation in a way that should provide significant for those involved in the specific situation (Maykut & Morehouse, 1994).

Maykut and Morehouse (1994) present an eight step set of characteristics of qualitative research:

1. *An exploratory and descriptive focus.*
Qualitative research is often used as the method of studying a social phenomenon using descriptive questions. The research becomes an interpretation of description.

2. *Emergent design.*
As oppose to quantitative research, qualitative research is less strict during data collection, using a much more flexible approach. One example is the sample of key interviewees which in this study in many situations emerged from previously interviewed people. Issues identified in the early phases of data collection can be adjusted throughout the data collection and research process by asking an additional and slightly different range of questions due to supplementary interesting issues emerging. Previously unimportant documents might become relevant to the study in light of new information obtained through qualitative data collection or analysis. This fact can either broaden or narrow the aims and/or objectives of the ongoing study.

3. *A purposive sample*
The purpose of the sample is to include participants (interviewees) with different views of a situation. Variety is more important than quantity. In many cases participants also represents various elements of a situation. An example of this is that one of the participants works as a divemaster, but does recreational fishing and surfing in his spare

time, thus covering several views and aspects of the case study. Another example is the leader of the local ski-boat club who is both a recreational fisherman and diver. The owner of a charter fishing operation also owns four boats used for commercial fishing in the area.

4. *Data collection in the natural setting*

Qualitative research is the attempt to understand people's experiences in context by investigating a given place as a researcher and to talking to people in their setting or area. The research automatically evolves into a combination of observation of a setting and its different features in addition to the registration of opinions gained from the people in the particular setting. This results in a broader and more comprehensive understanding of a phenomenon.

5. *Emphasis on human-as-instrument*

The researcher can act as an instrument to observe or capture situations or phenomenon's which are impossible to register with traditional quantitative data collection. The researcher himself or herself as an observer therefore becomes an instrument for data collection and analysis. The researcher must be flexible but objective.

6. *Qualitative methods of data collection*

Qualitative research captures people's words and actions. Examples of typical methods are observation, in-depth interviews, and the collection of relevant documents, group interviews, photos and field notes.

7. *Early and ongoing inductive data analysis*

Qualitative research is on-going with no clearly contrasted end, and it is possible to keep adding to the data collection (as in emergent design). The main focus is usually not guided by the researcher, but by the participants and what emerges to be of importance for a specific situation or people. This might lead to either a broadening or narrowing of the original aim of the study.

8. *A case study approach to reporting research outcomes*

Case studies are often the most constructive means of presenting qualitative data and analysis of an area or social situation. A case study is descriptive and explains to the reader the different aspects of the case. A case study can be as long as a book, or as short as a page or an article. However, the case study must provide the reader with enough information to be understandable, usable and comparable with other case studies.

A potentially negative aspect of conducting case studies can be that the participants in the research could potentially be offended if people and their lives are made into "cases". It is important to emphasise that the use of the word "case" is referring to the setting or situation, not the person.

The qualitative methods used in this study were chosen because they were considered the most useful for obtaining the most relevant data for the purpose of the study according to its aim and objectives.

4.2. Methods and techniques used in the study

A variety of different techniques were used to obtain the data for this study in order to gather sufficient and useful information.

4.2.1. Secondary data collection

Secondary data for this study was obtained from books and journals from various scholars and authors. Literature was sourced from the University of KwaZulu-Natal Library, the Natal Sharks Board (NSB) and Oceanic Research Institute (ORI) Libraries, in addition to the Internet.

4.2.2. The Natal Sharks Board Library and Archive

Little specific information about Protea Banks was available with the exception of two articles in diver magazines and a promotional short video of Protea Banks as a dive site. Protea Banks was also very briefly mentioned in a few dive site books. The NSB Library provided for secondary data concerning marine protected areas, local government coastal

management, shark management and conservation and marine tourism. The NSB also provided detailed scientific articles and papers on the shark nets in KwaZulu-Natal and on shark biology.

4.2.2.1. Historical review of marine tourism and sharks on the South Coast

Newspaper articles from the NSB Library were examined for relevant historical background from the media for the study area and used for the historical review in chapter 4.1.

4.2.3. The Oceanographic Research Institute (ORI) Library

The ORI Library contains a wide range of information on marine issues, from marine biological data to biodiversity literature and international marine policies. Specific information on marine protected areas, marine environment and user conflicts was also collected from this library.

4.2.4. The Internet

The Internet was mainly used for information on the study area. Much information on Protea Banks and in particular the user conflict and court case between the local fishing charters and dive operators was found in an online local newspaper and other media archives. Additionally, the NGO called Sharklife based in Shelly Beach has a comprehensive web-page which proved useful for background information and providing contact details for direct stakeholders at Protea Banks. The Internet was also practical for finding contact details for dive operators and other stakeholders in the Shelly Beach and Margate area.

The Internet was used for accessing South African governmental documents such as policies and legislation, through both national and regional authorities' web-pages. International regulations, guidelines and policies were also located via the same source.

4.3. Primary data collection and techniques

A total of 15 interviews were conducted. Please see Appendix I for more detailed information of the interview participants.

4.3.1. Semi-structured in-depth interviews

The primary research data for the study was collected in the form of interviews with direct and indirect stakeholders in association with Protea Banks. Using interviews as a method for primary data collection is a typical social science approach (and not common within natural sciences). Interviews can be structured with a specific and prepared set of questions the interviewer asks one by one in a certain arrangement. Prepared and strictly structured interviews allows for comparative analysis on selected topics. A less structured interview could, however, lead to a more true presentation of the interviewee's perception, opinions and attitudes. The interviewer might not use precise questions, but rather a checklist of relevant topics to be covered throughout the interview. A combination of these two techniques can also be used (Preece, 1994).

The interviews for this study were conducted in-depth with a semi-structured approach, utilising open-ended questions allowing for flexibility and a conversation style dialogue (Jordan & Gibson, 2004). The choice of using a qualitative primary data method is based in the interest of understanding the detailed needs for a potential management plan for Protea Banks. A more quantitative approach might be interesting (for example, approaching the local residents in association with the area), but for the purpose of this specific study in-depth interviews with key persons is hoped to contribute to specific, detailed and useful information. The main questions used in the various interviews were similar, but with additional specific questions depending on the interviewee's association with Protea Banks. The questions were kept relatively open to change during the interview, depending on the process of the interview.

The purpose of the interviews was not only to obtain a "snap-shot" of the current situation, but to create an understanding of the history, development and present use of

Protea Banks as a natural resource and marine tourism site (setting), in order to progress towards the best possible and sustainable future use of Protea Banks.

Semi-structured in-depth interviewing as a method for collecting primary data has both advantages and limitations. The interviews are flexible and adaptable, allowing for new ideas and topics to emerge throughout the actual interview. However, specific questions can be present for every interview, opening for direct comparison analysis.

In-depth semi-structured interviews can potentially provide detailed and complex descriptive information, which is usually not gained through surveys or questionnaires. Face to face interviews also (almost) eliminate the risk of the interviewee misunderstanding the question (high validity), in addition to creating a more personal and comfortable setting for both parties. Minimal equipment is needed and interviews can be conducted without any specific time or spatial restrictions. Semi-structured interviews allow for some structure, while simultaneously allowing inexperienced researches to develop their own interview style (Jordan & Gibson, 2004).

There are some potential limitations to the semi-structured in-depth interview method. Misinterpretation by the researcher (or the participant) might occur. The interviewer might consciously or unconsciously manoeuvre the interviewee in a certain direction of opinions. The accuracy of the data relies on the knowledge, but more importantly the honesty of the participant. The interviewer might be steered away from the actual topic due to the flexibility of the interview structure (however, this might be a way of collecting other important information). Interviewing and the following organising and analysing of the data collected can be very time-consuming. But, maybe one of the most relevant potential limitations is the willingness of the participant to be interviewed, as each interview can take up to an hour or more (Jordan & Gibson, 2004).

4.3.2. Interview questions

The interview questions were based in the objectives for the study. The interviewees were first asked to present themselves and their association with Protea Banks. Secondly, they

were asked to describe Protea Banks and their use of the area. Questions about other user groups' utilisation of the area and user conflict were also added. General questions about marine tourism and shark management in South Africa were asked. The second part of the interview regarded the management of Protea Banks recreational fishing and diving. This segment also included the issue of marine conservation and marine protected areas. The open structure of the interview lead to very differing additional questions, and a variety of additional themes emerged during the interviews.

4.3.3. Equipment for recording data

The following equipment was used for recording primary:

- ✓ Dictaphone and tapes
- ✓ Digital camera
- ✓ Field notebook for observations
- ✓ General notebooks
- ✓ Diary and contact lists
- ✓ Mobile phone

Recorded data was numbered and transcribed as it was generated.

One interview was conducted as a phone interview on account that the interviewee is based in Cape Town (Marine and Coastal Management).

4.3.4. Sample methods and criteria

The most significant aspect of any sample size in qualitative research should be the actual quality of the information and data gathered, not necessarily its quantity. The sample size should reach a stage of saturation of information (Maykut & Morehouse, 1994). In this study the main aim was to cover all the relevant user groups at Protea Banks through key informants. The divers, fishermen, launching area representatives, marine scientists, shark scientists and the relevant authority for marine tourism and conservation.

The researcher attempts to understand a setting or situation and its stakeholders by contact with its key representatives and related instances or organisations. The aim is then to register and present the full scale of all the various opinions within that specific setting.

The criterion of sampling approach is called maximum variety sampling. It is necessary to recognise that the data or answers in the interviews can not be generalised. However, the goal is not a random sample, but selected key representatives from the various user groups and related authorities and institutions (Maykut & Morehouse, 1994).

The snowball sampling approach is described by Maykut & Morehouse (1994) as the process where the contact with one research participant leads to contact with another (or snowballs). It is emergent and sequential, and practical to use in combination with maximum variation sampling. The sample in this study was much based on both snowball and maximum variation sampling techniques (please see Appendix I for a list of all the interview participants).

4.3.5. Field visits, observation of the study area and participant observation

A total of three trips to Shelly Beach were conducted. The majority of the interviews (direct stakeholders) were carried out during these field trips. Observation of the launching site and the general Shelly Beach area, in addition to informal conversations with local people and users of Protea Banks, provided for information registered in field notes. The tourist information centre located at Shelly Beach was visited for the purpose of finding brochures from the various tourism operators in the area, and to obtain contact details of marine tourism providers in association with Protea Banks.

Four dives with two different dive operators were conducted. Three of the dives were at the Southern Pinnacles and one at the Northern Pinnacles.

The Natal Sharks Board based in Umhlanga provided in kind entrance to their exhibition, shark dissection and film presentation. Additionally, an in kind observational trip onboard one of the NSB's boats for the purpose of viewing the shark netting maintenance was contributed.

4.4. Processing and analysis of primary data

Dey (1993 in Kitchen & Tate, 2000, pp. 230) suggests "that the core of qualitative analysis consists of the *description* of data, the *classification* of data and seeing *how concepts interconnect*". In other words, qualitative data analysis is presentation of the data, breaking it into smaller sub-selections, in order to rebuild the research result in a presentable design to provide a new insight to a phenomenon. Description should include situational context as this might affect the data and its collection. The situational context covers social setting and context, spatial arena (place) and timeframes. The intention and meaning of the research participants is also important to clarify. This can be difficult in, for example, observation methods, while in-depth interviews open up for the opportunity of investigating the background of the interviewees, thus their genuine opinions (Kitchen & Tate, 2000).

The classification of the data is breaking up the information and arranging it into a system of categories. The data needs to be coded, meaning numbering or otherwise symbolising the different sub categories within each interview, and rearranged into themes (Kitchen & Tate, 2000). The classification and breaking up of data in this study was separated into units based on the objectives of the study (on which the main themes of the interviews were established). The different additional categories that emerged during the different interviews were classified separately.

What is possibly most interesting part of the analysis is finding the interconnection between the different classifications, "interrogate the data", and to construct an understandable structure of the patterns, links and associations that emerge. The progress can be described as finding similarities and differences within the data. The classifications or themes are further refined and divided into sub-themes. These sub-themes should be internally consistent (refer to the same issue), conceptually related and analytically useful (relate to the aim and objectives). The division of categorised data into sub-themes is called splitting (Kitchen & Tate, 2000).

The results and analysis of this study are presented in themes from the classification process with sub-themes within each category. However, the original raw data (direct transcripts of the interviews) was also used in order to not lose the context in which each theme emerged and for cross-checking of the findings.

4.5. Limitations of the study and its methods

Firstly, one limitation of the study is the restricted timeframe within which the study had to be completed. The study was conducted as the thesis component of a one year Master in Environmental Management (coursework) which also includes four subject modules.

Financial issues limited the study as the numbers of trips taken to the study area were dependant upon the amount of money available for disposal.

Another limitation was the willingness of people to be interviewed. Most of the local recreational users, for example, referred to a key representative such as the ski boat club leader or a dive operator. Hence few interviews have been conducted, but the focus has been on key representatives for the various user groups and stakeholders as described in the sample methodology.

There is a lack of detailed secondary data available specifically on Protea Banks due to lack of previous studies of this particular reef.

The study is based on qualitative data. The results are dominated by estimations, opinions and experience by the stakeholders and must be considered as assumptions rather than scientific facts. Therefore, the objectives are related to the stakeholder opinions rather than scientific facts.

Finally, some of the issues that surfaced during the interviews can be classed as somewhat controversial, personal or sensitive. Many statements within the discussion are therefore presented by Anonymous or not referenced.

5. PERCEPTIONS AND MANAGEMENT OF SHARKS

5.1. Introduction

This chapter contains a brief historical presentation of the origins of anti-shark measures along the South Coast of KwaZulu-Natal and the shark attacks that lead to the instalments of these measures. The presentation is based on newspaper articles from South Africa and KwaZulu-Natal in an attempt to present how sharks have been described historically in the general media and how the issue of sharks has evolved through time, often with a conflicting view between tourism economics and conservation.

The second part of the chapter presents the human perceptions of sharks and a brief look at shark fishery management.

5.2. Sharks and marine tourism history on the KwaZulu-Natal South Coast; economics and emotions[1]

A newspaper article in the Natal Mercury 1905 warned bathers of the potential danger of shark attacks after a reported sighting of a 12 foot shark described as "a very ugly brute" and "a man-eater" (1).

In 1944 a 19 year old boy on holiday, Dennis Nissen, was attacked by a shark at Margate while swimming with two local lifeguards off the beach. The shark bit the boy's leg and swam away with him. The lifeguard tried to hold on to the shark to save the boy, but he disappeared with the shark, and his body was never found (2). A 36 year old man, David Drummond, was bitten in the lower leg by a shark off the coast of Scottburgh on the KZN south coast in March 1945. He survived and was taken to hospital where the doctors amputated his injured leg. This shark attack was the 13th since 1940, of which nine were fatal (3).

The lack of effective anti-sharks measures was a hot topic in the beginning of the 1950s. The threat of potential shark attacks was believed to scare the inland tourists from spending their holidays, and their money, in Durban and at other seaside resorts along the

[1] The newspaper sources for this sub-chapter are listed numerically in the reference pages 149-151.

coast. Various protective techniques and technical structures had been built and tested, such as wooden permanent enclosures, but the area in which these were located was limited and their effectiveness was not as desired. Shark attacks still occurred. The government was criticised for not taking any direct action concerning "the abundant man-eaters". The cost of implementing effective anti-shark measures was frequently compared to the potential loss of financial income from tourism (4).

The general view on sharks, without distinguishing between the different types of sharks, was that of a man-hunting and man-eating monster. This monster was not only a threat towards people and their lives, but towards the local economy. The man-eaters were seen as destructive to the reputation of the Natal Coast as a tourism destination and a threat to the important financial income from tourism.

The first shark-nets implemented as anti-sharks measures were introduced in April 1951 at the Umgeni River mouth as an experiment by the City Council. Four 150-yard nets were put in place. However, not everybody was pleased with this decision including the local fishermen (5). The following month the experiment was to be assessed by the City Councillors, and the Natal Coast's holiday industry annually estimated at £5,000,000, would be one of the significant topics of the evaluation. Statistics of shark attacks on the Natal Coast and on the Australian Coast were compared, but with several difficulties. The Australian coastline used in the comparison included a total of 12,210 miles while the Natal Coast is only 360 miles. Australia had 77 attacks within a time span of 31 years, from 1919 and 1950. The Natal Coast had experienced more than one third of 77 attacks during only 11 years (6). However, the financing of the netting continued to be a hot political issue between the Parks and Recreation Committee and the City Council's Financial Committee (7).

5.2.1. South Coast shark attacks and Black December 1957

In December 1957 a series of shark attacks on the South Coast of Natal commenced and this period has later been named the Black December. On the 21st of December 1957 a 14 year old boy was bitten by a shark while swimming at around 30 yards from the beach at

Uvongo on the South coast. Around 40 other bathers were in the water at the time, witnessing the incident up close. The boy's body was taken to the beach, but he was already dead from the injuries (8). The third shark attack in just one week (two of which were fatal) during December happened on the 24th in the view of over 200 Christmas holidaymakers. A 23 year old man on holiday was bitten, and died on his way to the hospital. The attack happened in the "centre of the bathing lagoon at Margate". The victim, James Berry, "was taken by a shark and dragged sideways trough the surf by the monster" (9).

Following the three attacks during the peak holiday season at the Natal South Coast, the Margate Town Council called an emergency meeting. The Council informed the public of measures including increased shark spotter air patrols using helicopters, and a higher number of full-time watchers on the beach. However, the holiday makers seemed relatively calm considering the situation and recent events, with people still sunbathing on the beach, but less people in the water. The Margate Councillor officially asked "the anglers and riflemen to assist in the destruction of shark and to concentrate on sharks around the river mouths" (10).

A fourth shark attack occurred at the South Coast before the end of the year. 14 year old Julia Painting was bitten while bathing at Margate beach the 30th of December. Again, the attack was witnessed by several holiday makers (estimated 2,000). The girl was rescued out of the water by another bather and holiday maker. A "human chain of people" reached out in the water to assist in the rescue and aid the life guards. The spotter helicopter had passed just moments before the attack, but not registered any sharks. Various eye-witnesses described the shark very differently. But, a man described as a "well-known Durban fishing authority" drew the conclusion that it must have been a ragged tooth shark. He described the shark as "one of the most dangerous and a cunning and quiet scavenger which creeps along the bottom towards the shore" (11). The ragged Tooth shark is today known as a very docile and non-threatening shark and a favourite of divers in the South coast area. Julia Paintings lost one of her arms in the shark attack, but survived thanks to a man named Mr. Brokensha, who intervened when Julia was attacked

(12). Mr. Brokensha was later awarded with the George Medal for his heroism in the situation of extreme danger and for saving Julia Paintings life (13). Julia Paintings recovered well and became famous for her strength and bravery (17, 18).

Following the attack the 30th of December 1957, bathing was temporarily banned by the Margate City Council to allow time for closing of the lagoon by using sandbags. The process of installation of permanent shark fences in the area was initiated (11). The potential banning of all bathing in non-protected waters caused different public responses. Some agreed with the ban as a precaution for shark attacks. Others stated that it should be up to each individual whether or not he or she wanted to go for a swim at any location on the coast. A letter to local newspaper highlights the fact that an increasing number of people were swimming in the sea, yet very few were actually attacked. He stated, maybe several years ahead of his time: "Can I assume that not one person in a million has been attacked?" (15). If fact, many started to realise that it might not be the sharks that are the problem, but the lack of understanding of these animals, and that more and more people are entering the sea for leisure purposes. Several previous myths of the sharks were slowly changing by the late 1950s. People realised that sharks could attack in water as shallow as a few feet. The theory of sharks only attacking men also ceased to exist, in addition to the previous misconception that people with dark skin were immune to sharks (16).

5.2.2. Anti-shark measures along the South Coast

A scientist from the Transvaal Underwater Research Group, Dr. Piet Boshof, warned against the mass killing of sharks in early 1958. He stated that the shark menace needed to be approached with care as the balance of nature might be disturbed, resulting in problems potentially bigger than the shark threats, including possible epidemics. He said that the shark attacks had created a mild public panic, even though in fact more people got killed on the roads than by the sharks. He also stated: "If we want to approach the problem, we must know the shark, and we do not." Bashof described sharks as beautiful creatures, cowards, but dangerous in certain situations, such as when hungry. He also spoke against the previous myth of splashing in the water to scare the sharks, stating that

these actions would actually attract them. Boshof also criticised the outputs of raw sewage directly in the sea, killing the fish on which the sharks usually would feed. He warned against baiting or killing sharks as this could perhaps cause new feeding grounds for the sharks and attract them (16). In January 1958 Durban City Council stated that they were pleased with the Durban shark-nets and the fact that no shark attacks had happened since they were installed. However, the nets were criticised for maybe not providing enough protection. On the South Coast, still un-netted as oppose to Durban, a man had recently been fatally injured by a shark at Scottburgh, but this was the first accident in 13 years on that beach. Another popular beach, Winklespruit, had not experienced any shark attacks since 1951, even without any shark-nets. Anglers and local fishermen claimed that several big sharks were still caught within the nets, and that almost a half of all the sharks caught in the nets were being caught on their way out towards the sea. The criticism claimed that the nets were not protective at all as the sharks could in theory swim in between them and with no problems enter the so-called safe bathing areas in Durban (19).

Late February 1958 the Mayor of Margate invited 22 journalists from the country's biggest magazines and newspapers for a update of the measures taken against the shark menace. He declared that Margate is now 100% safe for bathers. No expenses had been spared to make the beach safe, with extra fences installed. Additionally, a local invention of a permanent steel fence had been put in place, and air patrol and spotter towers were no longer considered necessary. The Natal South Coast Anti-Shark Menace Committee was to pass on the knowledge of providing safe bathing to all the other resorts on the South Coast. The Mayor was thankful for the community effort shown in the fight against the shark menace and said that " More permanent measures will be taken later , but in the meantime we can assure all holiday-makers to Margate that they have nothing to fear while bathing at our beaches" (20).

Faith in the shark-nets was also shown by one of the shark attack victims who lost his leg due to an attack. He said that he was keen to get back into the surf, but that he would probably keep on the right side of the nets (21). April the 3rd 1958 a man got attacked and

killed by a shark off the beach of Port Edward on the South Coast. He was the sixth person attacked by sharks on the South Coast since December 1957 (including the attacks at Margate, Uvongo and Scottburgh). As a response to the Port Edward attack a Professor named Smith, on his way to a Shark Conference in New Orleans stated: "There is not a single seaside resort in South Africa that can afford to ignore sharks. It is a national problem and the Government should take a part in solving it" (22). The local communities showed empathy with shark victims and their families. In August 1958 Local Trusts such as the South Coast Herald Shark Victims Fund distributed various amounts of financial support to surviving shark victims and the families of dead shark victims (23).

The fishing of sharks and commercialisation of shark meat and products became a process of concern. Dr. David Davies of Durban's Marine Biological Research station expressed concern with the problems with transporting shark meat as this type of meat needs very specific treatment in order to be edible. Additionally there was prejudice against actually eating shark meat in South Africa. Other shark products such as liver oil had strong competition from synthetic options, and the shark skin leather products never really took off. Another problem acknowledged by Dr. Davies was the fact that local shark population seemed to be very vulnerable to over-fishing. He used the shark-nets as an example. There was an initial boom of large number of sharks caught, eventually stabilising at a relatively low number of catches (24).

A collaboration between the Durban's Marine Biological Research station and the Council for Scientific and Industrial Research (C.S.I.R.) was formed in the early 1960s in order to study the sharks and to solve the shark menace problem of South African beaches (24). The C.S.I.R. experimented with electrical anti-shark measures in the early 1960's, but these techniques were criticised for not being effective. The permanent shark fences which had been installed on several beaches along the South Coast were disapproved of by many, including representatives of the South African Surf Lifesaving Association, as they were considered impractical due to the pounding surf, the constant shifting of the sand and the high maintenance cost. No shark attacks had occurred after

the installation of the shark-nets in Durban, and the option of these nets as anti-shark measures seemed to be preferred by both scientists and the public. The Surf Lifesaving Association had approached the South Coast Authorities and the Provincial Administration as early as 1958 asking them to work out a scheme to safeguard the entire South Coast (25). The shark research at the Durban Aquarium on sharks in captivity, and the shark and anti-shark measure research performed by the C.S.I.R and the Oceanic Research Institute was already in 1960 internationally renowned. Research on electrical shark repellents was continued, but it was the nets that got the most attention as a functional and effective method for avoiding shark-attacks and providing safe bathing. No attacks had happened since the installations of nets in Durban in 1952. However, Dr. David stated in May 1960: "There is no simple explanation for this since the nets do not form a continuous barrier which sharks can not penetrate" (26).

The importance of the shark nets for the tourism industry was evident in the pro-netting attitude of the various tourism businesses along the South Coast in 1960. However, the cost of these installations remained a problem. In 1960 only Durban and Margate had installed a consistent system of anti-shark measures. The owner of the biggest hotel in Margate, Mr. King, stated that: "One would have thought that the government, which benefits as much as anyone from a healthy tourism industry, would have interested itself far more in the problem than it has done thus far. A £7,000,000 industry is worth protecting" (26). In December 1960 a black man was attacked and killed by a shark in Margate, leading to the installation of a permanent netting enclosure for "non-Europeans". Two of the shark's teeth were found in the attacked man's legs, and lead to valuable research information for the Oceanic Research Institute concerning the shark species and size (27, 28 and 29).

February 1962 witnessed another two fatal attacks on the South Coast. A 13 year old boy and a 24 year old man, who were both attacked while swimming at Winklespruit, by what was assumed to be a *carchorinus zambezensis* also called grey shark or shovel nose in the 1960's. The grey shark was considered to be responsible for the majority of all shark attacks on humans on the Natal Coast. Grey sharks had been successfully kept in

captivity in Durban and research had been conducted by the Oceanic Research Institute, and in 1962 an anti-shark research body was formed to co-ordinate the research on anti-shark measures; the Anti-shark research Association Ltd. (30, 31). The Grey Shark is today better known as the Bull Shark internationally or the Zambezi Shark (*carcharhinus leucas*) in South Africa (Bass *et al.*, 1973).

Following the two shark attacks in February 1962 on the South Coast a "Save the South Coast" plea was sent to the Parliament from a local South Coast government. Meetings between the national and local authorities were organised to discuss "new ways of combating the shark menace which is rocking the tourist trade to its foundations", and a 10 day bathing banning in unprotected areas of the South Coast was put in place (31). The local media called for immediate increase in shark protection after the two attacks at Winklespruit "to halt further loss of lives and to safeguard the economy of the South Coast" (32). The Administrator of Natal, Mr. Gerdener stressed the need for dealing with the shark menace as this was affecting Natal directly and also indirectly influencing "our finance" (32). However, while many of the local authorities on the South Coast were pleased with the existing solution of using enclosed permanent nets at the most popular beaches, other user groups including the Lifeguard Associations were more interested in the Durban type of off-shore nets, allowing for a more varied and spacious use of the beach areas (33). Gerdener and the South African Surf Lifesaving Assosiation later met and discussed various anti-shark measures (34).

Dr. Davis of the Oceanic Research Institute stated in an interview with a Sunday Tribune reporter that his staff were working full-time on the issue of anti-shark measures, including bubble barriers, sound effects and electrical barriers. He also said that the of-shore nets as used at the Durban beaches were effective, "but only a temporarily solution to the problem". However, one of the biggest problems seemed to be the financial support for the shark research (34). Dr. Davis also tried to calm down the public shark panic by comparing the number of shark attacks with the number of road accidents. The total number of attacks between 1950 and 1962 were 56, of which 26 were fatal. The total number of road accident was higher than the previously mentioned numbers, in just one

Easter weekend in 1962 (35). The discussion of the need to protect the financial important tourism industry in Natal continued during the 1960s. In 1964 the tourism industry was estimated at R10,000,000, with over 300,000 annual international and domestic visitors, and significant for the total economy of the Natal coastal areas. Several resorts and other tourism developments and investments were established and expanded along both the northern and southern coastline of Durban. The shark menace in Natal began to receive not only national attention, but also international media coverage. In one book about shark attacks the Natal South Coast sharks was described as "breaking all the records of Natal or anywhere else in the world" (36).

The shark-menace threatening the tourism industry was of such importance financially that the investment of costly anti-shark measures was seen as a necessary investment for the future of tourism, and every effort should be made to introduce adequate and effective measures to remedy this unfortunate state of affairs (36). Additionally, the rapidly increasing tourism industry along the Natal Coast benefited not only the tourism businesses at the resorts, but also benefited indirectly businesses and areas further inland. Margate, the second biggest holiday resort on the South Coast, had no off-shore shark-nets like Durban before 1964, and the Margate Beach permanent fencelike enclosed bathing areas was very limiting on beach activities and not very visually pleasing (36, 37). In 1964 the Margate local authorities agreed upon installing shark-nets similar to those used for 13 years already at the Durban beaches. Nets were also installed at Uvongo and Scottburgh along the South Coast, in addition to coastal resort towns on the north coast of Durban. Mr. van der Merwe, president of the Hibiscus Coast Chamber of Commerce, stated: "the offshore netting would be a great attraction for surfers". He, together with many others, was certain that netting was the only practical solution to the shark-menace along the South Coast (38).

5.2.3. The Anti-Sharks Measures Board and shark research

The Anti-Shark Measures Board was founded in 1964, with a mainly supervisory and coordinating role concerning anti-shark measures (Dudley & Gribble, 1999). The same year the Anti-Shark Measures Board assisted various local authorities with the

installation of shark-nets, as well as sponsoring the local resorts financially to set up a system of maintenance of the nets. The Board was at this stage also experimenting with organised long-line shark fishing as another anti-shark measure (38). However, the maintenance of shark nets was the responsibility of each local resort or municipality until 1974 when the Anti-Sharks Measures Board took over all responsibility of the nets from the previously independent contractors and municipal employees (Dudley & Gribble, 1999). From 1982 the Board was solely responsible for the service and maintenance of all the nets between Richards Bay and Mzamba River (Davis *et al.*, 1989).

During the second part of the 1960 much research concerning anti-shark measures was centred on electrical repellents or barriers. These structures were mainly tested out in the St. Lucia area by the Oceanic Research Institute with satisfying results. Simultaneously, the use of SCUBA diving for the purpose of shark research was recognised as being the best method for observing shark behaviour (39). Different structures of electrical shark barriers were constructed and tested at the Margate beaches during the late 1970s. In the beginning of the 1980s the CS.I.R. installed an anti-shark electrical cable offshore Margate for further testing of the electrical barriers used during research in the St. Lucia area (40). The electrical barriers installed in June 1981 were a complex experiment, which unfortunately failed. The 540 metre cable was installed just to be taken out few days later, and the experiment was to be reviewed by the C.S.I.R. (41).

The late 1970s and early 1980s witnessed a change in the view of shark-nets as protection for coastal recreation and tourism. The regional authorities of Natal started to have concern about the ecological effects of protecting the tourists and bathers at the beaches. A report by marine biologist van der Elst at the Oceanic Research Institute caused a conflict between the ORI and the Natal Anti-shark Measures Board. The report stated that the nets had caused the killing of several large local sharks, while the smaller sharks often escaped the nets. The smaller sharks as a result escaped their natural predator of larger sharks. An "explosion of smaller Dusky sharks" was feared in the 1980s (40). Small Dusky sharks was assumed to be responsible for some minor attacks on the South Coast, however, the potential danger of the Dusky population to grow both in size and

abundance was also a relevant issue (40). The adult Black Fin shark and the Zambezi shark populations who both prey on smaller Duskey sharks were believed to be severely reduced due to the shark-nets (41). The study conducted by Van der Elst (1979) showed an increase in recreational and sport shark fishing and a significant decrease in the weight of the sharks caught between 1956 and 1976. The pattern of species caught had also changed over this ten year period. While the bigger species of sharks such as Zambezi (*carcharhinus leucas*), Great White (*carcharodon carcharias*), Hammerhead (*sphyrna lewini*) and Ragged Tooth (*odontaspis taurus*) had been relatively frequently caught off the Natal coast pre-1967, the two main species of sharks caught after 1967 were the smaller Dusky shark (*carcharhinus obscurus*) and Milk shark (*rhizoprionodon actus*).

The Dusky can often reach over 3 meters of length, but the sharks caught along the Natal coast were rarely over 1 meter, indicating that these sharks were juveniles. The Milk shark, however, is a much smaller species rarely exceeding 1 meter. The catch returns from the shark-nets off of the Natal beaches showed a high catch rate of sharks during the first years of instalment, followed by a rapid decrease and stabilisation. Sports anglers noted a significant decrease in the frequency, abundance and size of shark catches in the areas with shark nettings, while the Zululand and Transkei non-netted areas continued to produce large shark catches (van der Elst, 1979). However, one might argue that the nets are effective in conducting the work they were put out to do. The shark nets are no physical barrier between the bathers and the sharks. The nets are gill-nets used as fishing devise in order to reduce the number of sharks in the area, thus decreasing the chance of a potential encounter between humans and sharks (van der Elst, 1979).

The reduction in number of larger sharks and predators of the smaller sharks due to the shark-nets resulted in less preditation on the smaller sharks and an increase of certain smaller shark species along some areas of the Natal coast. Van der Elst (1979) gave a warning concerning the increased number of juvenile Dusky sharks registered in the 1960s and 1970s due to the protective gill-nets. The nets could actually have a reversed effect of the bathers safety when the increased population of Dusky sharks reach adulthood and become a potential danger for humans.

The Anti-Sharks Measures Board changed its name in 1982 to the Natal Sharks Board (NSB). In addition to protecting the tourism industry and the bathers, the Natal Sharks Board is now a tourist attraction in itself with an exhibition of sharks, a shark movie, shark dissections and the history of shark attacks. The NSB also conduct significant biological research on the sharks caught in the nets (Cliff & Dudley; 1991, Dudley, 1996). The amount of shark-nets increased from 1.65 km in 1952 with nets only around Durban to 14.27 km of nets in 1966 with 17 installations. The total fishing effort (km of nets) increased steadily during the 1970s. In 1980 there were 37.77 km of nets divided at 42 installations. The highest number of total fishing effort was reached in 1991/1992 with a total of 44 installations and 44.56 km of shark nets. However, since the beginning of the 1990's the NSB has reduced their fishing effort after considerate research on sharks and protective shark measures. The total fishing effort was in 2004 reduced to 27.55 km of gill-nets with 38 installations in an attempt to kill fewer sharks while still providing protection for tourists and locals utilising the beaches for marine recreational activities (Dudley, 2005).

The decades between the late 1970s and today have shown a general shift in the view on the shark issue from that of wanting to eliminate them to instead wanting to conserve and protect the shark as the important apex predator of the ocean. The topics of shark management have changed drastically in 50 years and today the governments and local authorities are facing a range of issues concerning sharks. However, the controversial topic of ecology versus economy, strongly affected by the general public's emotional aspects on sharks, still remains today with opposing views on shark management.

5.3. Human perception of sharks

A study conducted in Australia in the 1970s investigated which word had the largest impact on the highest number of people. Words such as rape, death, murder, poison, love and sex were used. However, it was the word shark that resulted in most emotions (Taylor, 1986). Sharks are the perfect creature for media sensationalism. Scary, mysterious predators with sharp teeth and known for attacking humans when they least expect it (Maninguet, 2003). The most famous shark, the Great White Shark, has had

many different names in South Africa, from Blue Pointer to White Death (Haselau, 1971) and the Zambezi shark was also often described as a brute, a man-eater and man-killer (Condon, 1971).

The Great White Shark is the most famous shark species, much due to its leading role in the "Jaws" movies (based on Peter Benchley's novel from 1984). In reality, the majority of sharks are much smaller, completely harmless and some have plates as opposed to teeth for bottom feeding. The possibilities of being attacked by a shark are often compared to the much higher statistical risks of being in a car accident or hurting yourself by slipping on your own bathroom floor. Other examples often used are that you are more likely to be struck by lightning, get killed by bees or win the lottery than being attacked by a shark (Ellis, 2003). But, these statistics might not really matter to many people. The fact is that people are still afraid of sharks and the thought of getting attacked, bitten and maybe eaten by an animal stronger, bigger and more dangerous than any man is terrifying for most people. But, does this fact give us the right to kill and over-fish sharks to near extinction? Following the famous "Jaws" movies many fishermen went out to kill as many sharks as they could (Ellis, 2003). "The only good shark is a dead one" became an unwritten rule (Taylor, 1986). There have been many competitions where the goal was to catch the most and the biggest sharks. Even though most of these competitions have ended, shark fishing (mainly for the purpose of shark fins and as unwanted unregistered by-catch) is still ongoing, actually increasing although the general shark stock is claimed by scientists to be decreasing (Ellis, 2003).

Killing sharks used to be a popular sport of male divers and spearfishermen in South Africa. The Natal South Coast was popular among spearfishers, but mainly during winter due to low visibility from river runoff in summer (Codon, 1971). The Ragged Tooth Sharks, or Grey Nurse Sharks as they are called in Australia, used to be very popular among the spear fishermen in the New South Wales waters. This species of shark has a fierce appearance, but is relatively harmless, docile and not aggressive compared to other big sharks. Unfortunately many shark attacks have been wrongly attributed to this

species, and killing them was considered brave and courageous (Ellis, 2003; Commonwealth of Australia, 2005).

Australia has two populations of Grey Nurse Sharks, one on the Eastern coast as mentioned and another on the Western coast. Due to intensive spearfishing the Eastern population is nearly extinct and listed as critically endangered and was declared a protected species by the New South Wales Government in 1984, the first protected shark in the world (Ellis, 2003). It is an example of how fragile shark population are to localised over-fishing. The West coast population is listed as vulnerable under the Australian Environment Protection and Biodiversity Conservation Act 1999. Grey Nurse Sharks are popular amongst divers. Australian authorities have in consultation with the dive industry created a Code of Conduct for diving with Grey Nurse Sharks. The Code of Conduct states that the divers must not (CoA, 2005):

- conduct night dives on known aggregation sites
- block entrances to caves or gutters
- interrupt the swimming pattern of the sharks
- feed or touch the sharks chase or harass the sharks
- interfere with the sharks using mechanical apparatus such as scooters, horns
- use Shark Pod/ Shark Shield Devices in known aggregation sites
- dive in groups totaling more than 10 divers

The dive operators are recommended to:

- implement the Code of Conduct
- give a dive brief is presented by the dive leader before each dive
- display the Code of Conduct in operators boats and shops
- participate in scientific research

It is illegal to harm, buy, sell or possess any endangered species (CoA, 2005). The Grey Nurse Shark protection in Australia is an example of how increased knowledge of a shark species has lead to the realization of how vulnerable they are to human impact and the need for ecologically sustainable management in order for the sharks to survive.

The general perception of sharks has changed somewhat over the past couple of decades. An example is the changes in practice by the Natal Sharks Board. Previously all the netted potentially dangerous sharks were killed, but they are now all released if found

alive (Cliff & Dudley, 1992). The general perception of sharks might still be dominated by fear, but more and more people also seem to be fascinated by them. Sharks are apex predators with a unique and essential role in the marine ecosystem. Nature programs about sharks on TV, books and magazine articles about sharks assist in creating a different view on sharks and one towards conservation (even though sensationalism is still very much present). Sharks are beginning to appear on endangered species lists and environmental non-governmental organisations (NGOs) such as the World Wildlife Foundation support research and studies on sharks. Additionally there are several smaller national or regional NGOs focusing on sharks and conservation in addition to raising public awareness about sharks (Gribble *et al.*, 1998).

5.4. Recent shark attacks in South Africa

Between 1980 and 1999 there were 86 shark attacks on people, of which 10 lead to the death of the victim. Over 90% of the victims were male with an average age of 22 years. Over half of the people attacked were surfers, while the other half mainly consisted of spear fishing divers in addition to swimmers. The majority of the attacks (34) were carried out by the Great White Shark, with the Spotted Ragged Tooth as number two (17). However, while the injuries from the Ragged Tooth sharks attacks were minimal, six of the attacks by the Great White shark were fatal. The Zambezi shark and the Tiger shark were responsible for six and three incidents respectively; both species with one fatal attack each. In 20% of the attacks the shark species responsible were unknown (Woolgar *et al.*, 2001).

The number of shark attacks is relatively low compared to the number of people actually using the ocean for recreational purposes. However, there has been an increase in the number of attacks in recent years in the colder waters of South Africa. This is believed to be due to the development and access to wetsuits allowing for longer time spent in the water. The southern and colder coastal areas of South Africa do not have (many) net installations and have had more attacks than KwaZulu-Natal which has a history of shark nets from the 1950s. There are mainly two types of shark bites; firstly for the purpose of investigation and curiosity and secondly for the purpose of feeding, which usually result

in the more serious and fatal outcomes. The most common reason for a shark attack resulting in death of the victim is haemorrhage, blood loss, or not reaching a hospital or getting treatment in time. Thus, control of blood loss in addition to fluid replacement is the most crucial action in a rescue situation (Woolger *et al.*, 2001).

5.5. International shark fishing and management

"*The appearance of man as a predator has confronted sharks with a mortality source that they cannot withstand*" (NMFS, 1997 in Stone et al., 1998, pp. 215).

Commercial shark fishing has increased in volume over the past decades. Estimated 182,000 tons of sharks were caught in 1994. However, due to lack of, and incomplete data the actual shark catches could be much higher (Anak, 2002). In fact 50% of the sharks caught are actually bycatch rather than from targeted shark fishing (Stevens *et al.*, 2000).

The most popular shark product is the fin. The fins are used as food to a large extent in Asian countries, but fin products are also consumed in many other parts of the world including Europe and the U.S.A. The fins have no specific taste and are similar to rice noodles after being boiled and treated. Almost all species of sharks are used for the purpose of harvesting the fins. The value of the fins is relatively high ranging from US$ 40 to over US$ 500 per kg (Anak, 2002; Fong & Anderson, 2002). A bowl of shark fin soup can sell for over US$ 100 (Ellis, 2003). Shark finning is known to be conducted in a very inhumane manner, with the shark often being still alive while its fins are cut off. The finless shark is then thrown back in to the sea to suffer a slow death (Stone *et al.*, 1998).

Shark meat is becoming increasingly popular and shark meat products are found in European supermarkets often sold as "grayfish" or "rock salmon". In Australia shark meat is sold as "flake". The Australians have their own version of fish and chips; flake and chips. A problem with the commercial fishing of sharks is the high level of urea in

the shark body, requiring relatively immediate treatment such as freezing or icing (Anak, 2002).

The rough shark skin is used in products including boots, handbags and watchstraps, and data from the U.S.A. shows an increase in the value and import of shark skin products. Shark liver oil is often used in the processing of shark skin products. Shark liver oil is also used in cosmetics and pharmaceutical products (Anak, 2002). Shark cartilage is believed to have a reverse effect against cancer and is used in supplements, but this medical effect is yet to be 100% proven (Anak, 2002).

Other shark products include teeth and jaws often sold as souvenirs. Shark meat and smaller sharks are often used as bait, and left over shark products are used as fertilizer for aqua culture feed (for example for shrimp farming) and even as feed for domestic animals (Anak, 2002). Live sharks are also popular in captivity for aquariums. Aquariums are very popular tourist attractions and often include educational features and information about the sharks for the public. Aquariums can play a very important role in educating and raising the general awareness of both children and adults concerning sharks. The display of the different species of sharks and information about their behaviour and biology can also contribute in changing many people's perception of the shark just as the monster from the famous movie Jaws did (Anderson, 2002).

Commercial shark fisheries have grown in small island states such as the Maldives in the Indian Ocean even though tuna is still the main resource for the country's fishing industry. The sharks caught were traditionally used locally with their oils used for treating the wooden boats. Today most of the shark catches are exported, mainly for the fins. A conflict has evolved following an increase in reef shark fishing since the mid 1970s. The reef sharks are caught for the same purpose as the oceanic species; fins and salt-dried meat to export. The two main parties of the conflicts are the reef fishermen and the local dive tourism operators as reef sharks are one of the main attraction for dive tourists visiting the Maldives. Estimations from 1992 showed that shark dive tourism as an export was worth US$ 2.3 million compared to that of US$ 0.5 from reef shark

product exports. Estimates of the economic worth of a single reef shark as a tourism resource compared to a dead reef shark, also show the economic high value of shark tourism (US$ 3,300 versus US$32 respectively). However, the economic benefits from tourism are not directly reaching the fishermen's pockets, but can be assumed to improve the general social well-being of the local community. Tourist dive operators in the Maldives have become front spokesmen for shark conservation. Consequently several marine areas, including 15 dive sites, were established as Marine Protected areas in 1995 (Anderson & Hafiz, 2002).

Australia has targeted shark fisheries which are considered important, maybe especially for the domestic demand of shark meat. In the different areas of water around Australia fishermen target different species according to their location. However, there has been a noticeable reduction in catches per unit effort and concern for the ecological long term effects of the shark fisheries emerged in the 1980s. But the shark fishery continues under various management plans. Australia also has protective shark-gillnets in Queensland and New South Wales off certain popular beaches, in addition to baited drumlines in Queensland. The shark catches have significantly reduced since the introduction of the nets in 1937 (New South Wales) and 1962 (Queensland). There is also a concern about the bycatch of turtles, dugongs, rays and dolphins. Additionally, most of the sharks caught are not used for scientific research (as oppose to in South Africa), but dumped into the sea (Stevens, 2002).

Sharks live long, grow slowly, mature late in their lifecycle and produce few offspring and targeted commercial shark fishing is doubted to be able to exist sustainably. This is called "K-selected" life history and is usually a result of being apex species without natural predators (Stone *et al.*, 1998). Additionally, sharks caught as bycatch are often not reported but believed to account for a significant amount of total catches. Trends in commercial targeted shark fisheries all over the world show the same trend. Initially there are very high catch numbers of sharks, followed by a rapid decrease and collapse. Examples from Ireland, Norway and California on targeted shark fishing show that a catches peaks in the first few years of the systematic fishing, followed by a very rapid

decline. Once over exploited, shark stocks do not easily recover (Walker, 2002; Fong & Anderson, 2002; Stevens *et al.*, 2000). This trend is also evident in the research conducted in KwaZulu-Natal by the Natal Sharks Board (Dudley & Cliff, 1993).

The removal of the top predator species can have irreversible biological effects down the food web and decrease productivity and diversity. Apex predators are more fragile to abundance harvesting and even the recreational fishing of these species can have very negative effects on the total marine biodiversity (Agardy, 2000).

Sale *et al.* (2005) state that there is currently an increasing general global threat to all fisheries of collapse. No-take areas or sanctuaries can support and improve different marine species. Larger areas might be the most effective, with the possibilities of a higher number of different species and the likelihood of the individual species to be protected during various stages of their life cycles. However, smaller areas are also seen as useful in a spillover aspect. Smaller or multi-use areas also allows the local coastal communities regions within which they can continue to fish as this might be imperative for life sustaining purposes whether for financial income or as protein resources.

One of the biggest problems for commercial shark fishing is the lack of monitoring and reliable data on the actual number of total catches, both targeted and bycatch. Additionally, lack of total knowledge about the sharks may hinder the sustainability of the international shark fishery. IUCN recommends that all regional and national fisheries agencies should develop ecologically sustainable management plans specifically for their shark fishing industry (Anak, 2002).

5.5.1. International shark fishery management plans

The USA has a history of shark fishery dating back to the 16th century and has especially during last century experienced several examples of productive first couple of years of shark harvesting, followed by rapid declines. The 1980s saw a domestic growing demand for fresh shark meat and foreign demand for shark fins triggering a rapid boost in shark fisheries. Concern for the unregulated fisheries and overexploitation of sharks lead to the

development of the Atlantic Sharks Fishery Management Plan in 1993, managed by federal authorities. The main concern relating to shark fishing was the lack of catch data and the controversial practice of shark fishing for fins. Some of the management strategies included quotas, permits, the presence of observers, prohibition of finning and establishment of recreational bag limits. In 1997 certain species were protected; Whale sharks (*Rhincodon typus*), Sand tiger sharks (*Odontaspis taurus*) and Bigeye sand tiger sharks (*Odontaspis noronhai*) and Basking sharks (*Cetorhinus maximus*). The Great White (*carcharodon carcharias*) was only allowed to be caught on a catch and release bases for recreational fishermen (Stone *et al.*, 1998). In 1997 the National Marine Fisheries Services stated that large coastal sharks were over fished and that pelagic and small coastal fish were fully fished. Simultaneously the number of permitted boats had increased and greatly exceeded the potential quota to be caught (Stone *et al.*, 1998).

International concern for the ecological effects of increasing demand and trade of shark products, parallel with poor knowledge of the global shark stocks, became an increasingly debated topic globally in the early 1990s. There is a need for improved fishery management and shark species conservation (Fowler, 2002; Walker, 2002; Fong & Anderson, 2002).

An important institution in this process was and still is the Convention on International Trade in Endangered Species (CITES). CITES and other organizations including United Nations Food and Agricultural Organization (FAO) formed specialist groups on sharks and their ecological status due to fishing and damaged habitat. CITES was formed in 1975 and established international legislation against the trading of endangered species and regulations towards the protection of endangered species. CITES is considered as very influential on the international political scene concerning natural resource management, with 150 country state members (Fowler, 2002; Walker, 2002). Several reports of the international ecological status of sharks from various specialists groups contributed to the 10th CITES Conference of Parties in 1997. CITES recommended that FAO developed and implemented a shark management plan to be adopted by the different countries (Fowler, 2002). The FAO International Plan for the Conservation and

Management of Sharks (IPOA-Sharks) was finished in 1998, following meetings the same year in Tokyo of the Technical Working Group on the Conservation and Management of Sharks and meetings in Rome; Consultation on Management of Fishing Capacity, Shark Fisheries and Incidental Catch of Seabirds in Longline Fisheries (FAO, 1998). The IPOA-Sharks is a voluntary action plan for shark fishery management to be adopted and adapted for each individual nation state, and each nation is responsible for developing, implementing and monitoring its own shark-plan. It is recommended that all countries contributing to shark killing should participate, and one of the leading guidelines concerns the importance of sustaining stocks: "Management and conservation strategies should aim to keep total fishing mortality for each stock within sustainable levels by applying the precautionary approach" (FAO, 1998).

In South Africa the Marine and Coastal Management (MCM) branch of DEAT has appointed a Chondrichthyan Working Group responsible for the development of a National Plan of Action (NPOA) in order to comply with the IUCN IPOA-Sharks. The South African NPOA is estimated to be completed during 2005. It is suggested by the MCM to utilize the White Shark Eco-tourism as a case study of shark conservation in South Africa (MCM, 2005b).

6. RESULTS AND DISCUSSION

6.1. Introduction

This chapter is a presentation and discussion of the primary data collected during this study regarding marine tourism, sharks and Protea Banks.

The first part of the chapter presents the results of the qualitative research of the study, which were conducted in the form of stakeholder interviews. The method used was semi-structured in-depth interviews with a sample of key representatives of the stakeholders in relations to marine tourism at Protea Banks.

The second part of the chapter presents the main findings of the study, based on the results. The main findings are divided into themes. The themes are the outcome of data analysis after having divided the raw data into categories and sub-themes.

Subsequent to the main findings of the study is a more detailed interpretation and discussion of the results and findings. The discussion is organised into sub-chapters based on the main findings and relate to the study objectives. The objectives of the study were as follows:

1. Identify current user groups (direct stakeholders) at Protea Banks;

2. Identify current practices and uses, guidelines and code of practices in association with Protea Banks mainly as a recreational and tourism resource;

3. Determine the stakeholders'
    a. views on the value of Protea Banks as a marine tourism resource and its management issues
    b. views on user conflict issues and how these issues can be resolved;

4. Determine the stakeholders opinion of shark management and conservation; and

5. Examine why Protea Banks is not a marine protected area (MPA), and determine whether there are any indications that it should be an MPA, based on stakeholder opinions, and to ascertain if other conservation measures are needed towards a management approach for Protea Banks.

6.2. Results of the study

A total of 15 semi-structured in-depth interviews were conducted for this study (see Appendix I for further information about dates of the interviews, names of the interviewees and occupation or other relation to Protea Banks and marine tourism).

The stakeholder interviews provided primary data on which the results are based upon. Field observation and informal conversation with local marine users was a secondary method used for obtaining information about Protea Banks and marine tourism. The sample method used in the study was mainly the maximum variety method. The method is not a random sample, but a selection of key representatives in a certain setting or in relation to a certain phenomenon (Maykut & Morehouse, 1994).

6.2.1. Objective 1: The current user groups and direct stakeholders at Protea Banks

Objective 1 of the study was to identify the current user groups and direct stakeholders at Protea Banks. The results of the first objective derive from primary data from the interviews and observation at the study area and must therefore be considered as estimates. The identified user groups are presented in Table 6.2.1.

Table 6.2.1. Current user groups and direct stakeholder at Protea Banks

User groups and direct stakeholders at Protea Banks	Number of operations/ people
Charter boat operators	• (Estimated) 30 • (Estimated) 5 active on a regular basis
Recreational sport fishermen	• Over 300 members at Shelly Beach Ski Boat Club • (Estimated) 14 000 recreational fishermen in KwaZulu-Natal
Commercial fishing operations	• 3
Dive operators	• 3 operators based at Shelly Beach (2 active on a regular basis) • Unknown number of operators sporadically visiting Protea Banks
Whale and dolphin watching operators	• One permitted operator
Recreational spear fishermen	• Unknown

The charter boat fishing tourism industry at Protea Banks is estimated to include 30 operators. However, there are only an estimated five operators active on a regular daily basis, including low season. During the high season the number of charter boat fishing operators is estimated to increase by up to 500% (from five to 30) compared to the number of charter fishing boats on a regular basis (Milton, 11/10/2005).

The number of recreational fishermen is estimated to be around 14 000 in KwaZulu-Natal (Mann, 15/08/2005). The number of members at the Shelly Beach Ski Boat Club has at present time passed 300 (Getz, 10/10/2005). There are three commercial fishing operators in the area (Field notes, 2005).

There are three dive operators located at Shelly Beach. There are additional dive operators that utilise Protea Banks on a less regular level. The external dive operators often collaborate with the largest and most active dive operator at Shelly Beach (Field notes, 2005). There is one permitted whale and dolphin operator launching from Shelley Beach (Field notes, 2005). The number of recreational spear fishermen is estimated to be insignificant due to the depth and current at Protea Banks (Field notes, 2005).

6.2.2. Objective 2: Marine tourism code of practices used by stakeholders at Protea Banks

Two user groups at Protea Banks follow specific code of practices developed by the users or operators themselves. The code of practices are informally agreed upon, but taken very seriously by the users (see Table 6.2.2.for an overview of the code of practices). The code of practices were described by the stakeholder during the stakeholder interviews and also observed at the study area.

Table 6.2.2. Code of Practices developed by the direct stakeholders at Protea Banks

User group / stakeholder	Code of Practice	Principles
Dive operators	Safety procedures	• Minimum level of dive qualification or experience required • Maximum 10 divers per dive • Sea conditions considerations • Experienced staff, skipper and crew • Thorough pre-dive briefing
Dive operators	Shark-diver interaction	• No feeding or chumming • No touching, chasing, threatening or otherwise harassing the sharks
Shelley Beach Ski Boat Club (recreational sport fishermen)	Sustainable and responsible fishing ("Gentlemen's agreement")	• No anchoring at Protea Banks reef • Only boat the caught fish you will eat yourself and release other fish you catch • No bottom / reef fishing

The marine tourism user groups and their utilization of Protea Banks are further described in detail in sub-chapter 6.4.1.

6.2.3. Objective 3a: The value of Protea Banks as a marine tourism resource

All the stakeholders describe Protea Banks as unique in various ways. The reasoning behind stating that Protea Banks is unique differs from stakeholder to stakeholder, or maybe more specifically from user group to user group. Table 6.3.2. shows extractions from nine of the stakeholder interviews relating to the value of Protea Banks as a marine

tourism resource. Protea Banks as a marine tourism resource is further discussed in chapter 6.4.4.

Table 6.2.3. Stakeholders' opinions on the value of Protea Banks

Stakeholders' opinion on the value of Protea Banks
"I have been fortunate to dive many times at Protea Banks and I have dived there a long time. I have certainly done 20 or 30 dives there. Saw sharks on a fair number of occasions. Ragged Tooth Sharks in the winter, Zambezi Sharks and big Hammerheads in the summer months and I certainly enjoyed diving there. I think one of the attractions of Protea Banks is to go and see big fish and sharks. You know the reef itself is not that pretty, there is very little coral there, so the invertebrates on the reef are not really much of an attraction, but what are attractive are the fish and the sharks".
"Protea Banks is probably the best expression of a big reef system on the whole of the KwaZulu-Natal coast". "There are a large number of different shark pits you may see on a dive at Protea, which makes it particularly exiting to divers". "Potentially Protea Banks is a real star in terms of opportunities for future shark diving and I'd like to see that developed and encouraged, but in the same way I would not like to see the fishermen being excluded and being given the short end of the stick. They do have a legitimate need and requirement from the area and the solution needs to take both sides into account".
"Protea Banks remains unique. You can talk to people worldwide and they want at least some opportunity to see sharks. You might be unlucky and not see sharks on each dive, but you will eventually see sharks and have a good experience. You never know what other experiences you might have or other animals you might see. You can go to other places, but you will not see apex predators as you do at Protea Banks".
"In the summer you can see up to seven different shark species in one dive. That is unique. There is no place in the world where you can get seven or more species on one dive".
"Protea Banks is really becoming known as one of the best shark dives in the world".
"It is important that you can work together even though you have different interests. The bottom line of the whole thing is that in 30-40 years time our grand children must be able to see the same things that we see today".

"Recreational fishing is better than any psychiatrist. Recreational fishermen go out for the enjoyment of being on water. If you catch a fish, it is a bonus. If you do not catch a fish they are not worried about it".
"Personally I think it is one of the best dive sites in the world". "Generally people, especially the South African market do not really know what they have got here, they do not really appreciate what they have got here. They think it is just another dive site. I give it a couple of years, it is going to get a lot bigger".
"It is an experience (fishing). You are alone out there. You are alone and there is something to see, like a giant manta ray might jump out or whales or dolphins. There is something about going out to sea that is different to any other sport, any other hobby, you with nature". "Fishing is a very great leveler. You can have a doctor on the boat, you can have any type of person on the boat. It does not mean to say that because you have so much more degrees that you are going to catch a better fish, you all become the same" "Whatever you got anywhere in the world, or in South Africa for that matter, you actually have everything here (at Protea Banks)".

6.2.4. Objective 3b: Stakeholders views on user conflict issues and how these issues can be resolved

User conflict in a popular marine tourism area is unfortunately a common situation. If it is not solved quickly the dispute might develop into an almost unsolvable and often very personal problem affecting all the users within a specific area (Lewis, 1996).

The conflict at Protea Banks between a charter boat operator and a dive operator has become a very sensitive and personal issue which none of the stakeholders feel comfortable discussing. There are two very differing and personal views on the dispute. Due to the personal manner of the conflict, much of the data concerning this matter has not been included in the results of the study.

All the stakeholders were aware of this particular conflict at Protea Banks. None of the stakeholders believed there will ever be a resolution to this conflict or any other positive

developments concerning this specific dispute in the near future. The conflict has now become a personal confrontation, with which none of the other stakeholders wish to be associated.

Regarding the issue of conflict 10 of the 15 stakeholders mentioned problems with legislation, regulations and the policing authority during the interviews. One stakeholder stated that there are occasional disputes concerning the use of the parking area during peak season in December. These issues are further discussed in chapter 6.4.2.

6.2.5. Objective 4: The stakeholders' opinion of shark management and conservation

Four of the interviewees stated that there should be a ban on shark fishing overall as it is unsustainable in the long term due to its fragile and vulnerable life cycle compared to other fish.

Four of the stakeholders (all related to diving) stated that the most important tool towards legislative protection and conservation of shark as a species is to raise public awareness and lobby for changes in the shark fishery legislation. Public pressure is stated to be the key towards change towards the protection of sharks. The problem of shark legislation and shark fishery is further described by these stakeholders as an international problem, as well as a national issue within South Africa.

One of the interviewed stakeholders stated satisfaction with the current shark legislation which is based on bag limits. Five of the stakeholders stated that there is a gap in shark research in South Africa.

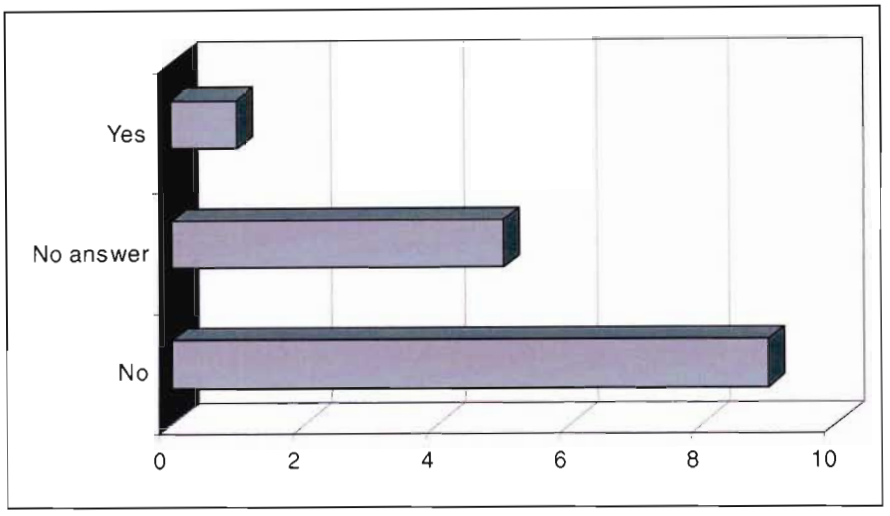
6.2.6. Objective 5: Protea Banks as a marine protected area (MPA)

During the preparation and early stage of the study the expected outcome of the question whether or not Protea Banks should become a MPA was believed to be closer to "in favour to" than "against". However, the results of the study, based on the stakeholder interviews showed the opposite (see Figure 6.2.6.). There were a total of 15 stakeholders interviewed of which one was entirely in favour of establishing Protea Banks as a marine

protected area. Nine of the stakeholders were not in favour of Protea Banks as a marine protected area.

Only one of the stakeholders was entirely supportive of the thought of Protea Banks as an MPA as mentioned above. One imperative factor was to involve the affected parties and reach a solution that would benefit all the users, while at the same time keep a focus on ecosystem conservation, raising marine environmental awareness among the general public and protecting sharks.

Figure 6.2.6. Stakeholders opinions on whether Protea Banks should be a MPA (n=15)



Nine of the stakeholders were not in favour of Protea Banks as a MPA. Three of these stakeholders emphasized the need to protect and conserve the sharks at Protea Banks, in addition to on a national and international level. Two of the stakeholders not in favour of the establishment of an MPA mention the need to protect the local reef fish. Five of the stakeholders stressed the importance of increasing public awareness about the need for marine conservation, but not necessarily by establishing a marine protected area. Three of the stakeholders was worried that the establishment of an MPA at Protea Banks would result in too many restrictions on marine tourism operators and therefore have more negative than positive effects on marine tourism in a long term perspective. One of the

nine stakeholders not in favour of Protea Banks as a MPA stated: "Whether Protea Banks is a MPA or not, it is already protected by the people".

The remaining five stakeholders did not directly answer the question, but stated that an MPA might possibly be an option in the future. However, all the five stakeholders stated clearly that if this is to happen it would have to be a bottom up decision, based on stakeholders' opinions and needs. One of the stakeholders mentioned the need for zoning within a potential MPA in order to allow for different user groups to continue using the area.

6.2.6.1. Stakeholders environmental concerns at Protea Banks and Shelley Beach

The results of the study found that the majority of the stakeholders were not in favour of establishing Protea Banks as a marine protected area. However, the stakeholders stated various environmental concerns in association with Shelly Beach, Protea Banks and marine tourism. The stakeholders' environmental concerns are listed in table 6.2.6.1 and further discussed in sub-chapter 6.4.3.

Table 6.2.6.1. Stakeholders environmental concerns at Protea Banks and Shelley Beach

Environmental Concerns
Decreased frequency sighted sharks during dives and general state of the shark population
Carrying capacity at Protea Banks during peak holiday season
The state of the reef/ bottom fish at Protea Banks
Lack of enforcement of existing fishery legislation and policing
Safety concerns and user conflicts during peak seasons by inexperienced skippers
Damage to the reef by divers
Increased number of charter fishing boats
Future state of the marine environment at Protea Banks
Lack of knowledge about sharks and gaps in scientific shark research
Over-fishing of game fish

6.3. Overview of the main findings

The study found through semi-structured in-depth interviews with key stakeholders that six different user groups are in direct association with Protea Banks. Other methods that were used were on-site observation and conversation with present users at Shelly Beach launching area. The information was recorded as field notes. Further background research to find stakeholders included utilising the Internet and tourist information brochures.

Four of the user group are various types of fishers: Commercial fishing, recreational fishing, charter boat fishing and spear fishing. The two non-consumptive user groups are divers and whale and dolphin watching operators. The different user groups follow a code of conduct developed and adapted over time based on their experience and knowledge of the area. The recreational and charter fishermen must additionally follow legislated bag limits concerning their catches. There is also legislation concerning whale and dolphin watching. The analysis of the primary data resulted in five main categories of information.

6.3.1. User conflict

The findings of the study, based on stakeholder interviews, confirm that there is a user conflict between two of the users in direct association with Protea Banks (fishing charter and dive operator). However, the conflict is not between all the dive operators and all the fishing charter operators, but more of a personal dispute between one charter operator and one dive operator. The topic of the dispute is the fishing of Zambezi sharks; the conflict has evolved into being a very personal and emotional confrontation. Other direct and indirect stakeholders cannot foresee a solution to the disagreement occurring in the near future, if ever. It is believed that the conflict has existed for too long a time and has become too personal for it to be reversed. Other direct stakeholders and user groups at Protea Banks do not want to be directly associated with the conflict.

Another conflict or rather disagreement became evident early it the study. There exists a problem between marine users and the policing and legislative authority. This finding has two aspects. The first aspect is how the marine users disagree with existing legislation

and how legislation is monitored and controlled. The second aspect is that on the whole, stakeholders have a total lack of trust and confidence in the relevant South African authorities, both when it comes to the actual legislation, and to its implementation.

6.3.2. Marine tourism seasonality and carrying capacity concerns

The study showed that as long as the launching tower is open there is only one limitation on the number of boats allowed to launch at any given time from the Shelly Beach launching site, that limitation being the weather conditions. As a safety precaution, launch tower personnel will not allow any boat to launch if wind speed exceeds 20 knots. During the peak holiday season of December the number of boats launching from Shelly Beach can reach up to 100 per day. There are three main problems with this intensive use of the Protea Banks area during December. Firstly, many of the holiday users have minimal experience in the often rough sea conditions and many boats flip over while going through the surf. As a result of this, holiday users and people who do not use the area regularly can find themselves in danger due to rough sea conditions and a lack of experience or practise. Secondly, there have been cases of conflict due to the high number of people present at the same time, mainly concerning the parking area. Thirdly, there is clearly an issue of the area's carrying capacity being exceeded during December as there are a very high number of boats conducting various activities simultaneously and there is no management except from the bag limits of fishing, and even this has proved difficult to control when such a high number of boats are operating at the same time.

6.3.3. Stakeholders environmental concerns

Different user groups have various differing concerns about the environment. The divers are worried about the over-fishing of sharks. The sport fishermen are concerned about the bottom or reef fish populations. The charter fishing boat operators mention potential diver damage to the reef. The tourism operators, both consumptive and non-consumptive depend on a healthy and abundant marine resource in order to survive as businesses, so are therefore concerned about the general state of the ocean, specifically local ecosystems. The owners and staff of the companies concerned are not only interested in

the ocean for reasons of financial gain, but also as private individuals with genuine concerns for their local environment.

6.3.4. Gap in shark research and scientific studies of Protea Banks

One imperative finding of the study is that there is a complete lack of any scientific research being conducted at or about Protea Banks. The only scientific study that has involved Protea Banks is a collection of seaweeds for a seaweed guide of KwaZulu-Natal. The study was not a South African initiative, but conducted by a team of Belgian students. Protea Banks is a relatively deep reef and technically challenging to investigate and has therefore not been included in studies by Ezemvelo KZN Wildlife reef studies or the Oceanographic Research Institute (ORI). ORI has proposed a study of Protea Banks, but it was not accepted for financial funding reasons.

Additionally, the study has found that there is a gap in general shark research in South Africa. Research has been carried out on Great White shark cage-diving in the Cape region. Most studies carried out in KwaZulu-Natal are conducted upon already dead sharks which have been caught in the shark-nets along the coast. These studies are of excellent value for several purposes, but do not explain shark behaviours or enable estimates of the frequency and abundance of different shark species. Furthermore, there are currently ongoing studies of Ragged Tooth sharks at Aliwal Shoal. But more research could be conducted relating to shark and human interaction. Feeding practises for the purpose of attracting sharks are of specific concern as this can create potentially dangerous situations for the diver, and also has the potential to harass sharks. There is currently no chumming or feeding of sharks carried out at Protea Banks.

6.3.5. Stakeholder opposition towards Protea Banks as a marine protected area

The study discovered that the majority (9) of stakeholders do not wish Protea Banks to become a marine protected area. The direct users of Protea Banks are not interested in Protea Banks as a MPA and are worried that if Protea Banks were to be proclaimed an MPA in the future their legal rights of using the reef will be diminished. A second concern is that there will be an introduction of fees. The system of fees to be paid to an

authority is looked upon with great scepticism. The majority of the stakeholders would rather see Protea Banks managed as it is now, mainly by the users themselves in a self-regulatory system. Concern is showed by the divers regarding general shark management in South Africa and internationally. The divers would like to see shark populations in general as protected species referring to the precautionary principle.

6.4. Further description and discussion of the findings

The study found a variety of different opinions on many topics in association with Protea Banks. The most frequently mentioned issues are discussed as follows in this chapter, based on the stakeholders' point of view, derived from the semi-structured in-depth interviews.

6.4.1. Marine user groups and their activities at Protea Banks

The study found, as mentioned previously, six main user groups at Protea Banks:

6.4.1.1. Charter boat fishing

The largest group of fishermen consists of charter boat fishing operations. There are an estimated thirty charter boats, with five charter boats operating on an active and regular basis. Other charters operate on a lower scale and some with their main focus during the peak tourist season. Charter fishing operators are only allowed to launch during sunlight hours, meaning from 4h30am during summer and around 6h00am during winter. All charter boats must be back at the launching site before sunset. The boat ride from launch to dive site only takes approximately 30 minutes, leaving many hours available for fishing each day. In other countries with popular deep-fishing areas the boat trip to the fishing area alone can be up to four hours. Protea Banks is famous for both the quantity and quality of fishing catches, with a variety of species available and often guaranteed catches by the charter companies. According to one of the fishing charters, there are different ratios for the possibilities of catching the various fish species in addition to being seasonal. These figured as based on the charter fishing companies' experiences, not scientific and statistical proof. According to one fishing charter, the probability of catching a shark is said to be 99.9%. Several foreign tourists want to catch big sharks and

consider shark fishing as a great thrill and adrenaline rush. However, it is stated that almost all sharks caught, are released (Milton, 11/10/2005).

With the exception of a few species, shark fishing is not illegal in South Africa. The fishing of a selection of shark species is regulated through either recreational bag limits or commercial exploitation. Three species are fully protected: The Great White shark, the Whale shark and the Basking shark. However, these three species do not frequent Protea Banks on daily basis.

According to the stakeholders, both the fishermen and the divers, the sharks' behaviour at Protea Banks has changed over the years. The sharks are said to have learned to differentiate between a dive boat and a fishing boat. Some go as far as to suggest that sharks have learnt to distinguish between the sound of the motors of dive boats and the motors of fishing boats, along with the different shapes and colours of the boats in use. Sharks are said to "park" under fishing boats and wait for the opportune moment to attack a hooked fish (Getz, 10/10/2005; Milton, 11/10/2005).

The fishermen experience what they consider a problem of too many sharks. Some fishermen call them taxmen, as they tend to always take a percentage of your catch. Several of the fishermen tell stories of how it is common to only boat 8 out of every 10 hooked fish. Sharks will have eaten the fish before it reaches the boat (Getz, 10/10/2005; Milton, 11/10/2005).

It is impossible to agree or disagree with statements concerning whether the shark behaviour at Protea Banks is instinctive or learnt over time. There is not enough scientific evidence to properly evaluate or quantify this phenomenon. A shark hunts and finds its prey through a series of investigations. Sharks have a range of sensory abilities which are utilised to locate and catch prey. Starting with the ability to hear and smell from thousands and hundreds meters distance from prey, to lateral lines and pit organs with which the shark can register movements and even heartbeats, along with vision, touch and finally taste (Andy Cobb, 01/09/2005). The instinct of a shark is to sense and attack

weak, bleeding, injured struggling fish. It is therefore instinctual that sharks prey upon hooked fish (Viljoen, 11/10/2005).

To fishermen, the killing of sharks can in some cases be understood as a vendetta. The fishermen struggle with getting their catch onboard the boats as the sharks eat their catches before they are able to boat the fish. There also used to be an annual shark fishing competition each December where a large number of sharks were caught. However, due to public resentment towards this competition, especially from the dive fraternity, it is no longer held. But the other problem is still believed to be there with fishermen killing sharks in frustration and anger for stealing their catches (Cliff, 26/07/2005).

6.4.1.2. Recreational sport fishing

The recreational fishing club at Shelly Beach was established in 1978. Areas of Shelly Beach were consequently cleared of rocks for easier and better boat launching. In 1982 the club house was built together with the boat launching control tower. A concrete ramp was constructed together with further rock clearance at the beach. The club was founded with only a few, around 10-15, members. The number of members grew to 30 and later more and more members were accepted. Eventually the number of members has passed 300. Today there is also a range of other marine based clubs in the KwaZulu-Natal South Coast area in addition to the Shelly Beach Ski Boat Club. Recreational angling has a long history at Shelly Beach. The main target of the sports fishermen are different types of tuna and other game fish such as sailfish or marlin and king Marcel (Getz, 10/10/2005).

There are an estimated 14 000 people in the KZN province who fish off of ski boats. Recreational fishing is considered a particularly popular attraction and a significant part of coastal tourism in KwaZulu-Natal. The contribution to the gross national product is believed to be over 1% (Mann, 15/08/2005).

Recreational fishermen, from both private and the charter boats must also comply with the quoted bag limits in the mentioned Act. In order to fish recreationally one must obtain a permit and it is illegal to sell any fish caught. As of April 2005 the bag limit for

recreational shark fishing is one (per species of shark) shark per day per person. Basking Shark, Great White Shark and Whale Shark are protected species (MLRA, 1998).

The local sport fishermen at Shelley Beach have a so-called "Gentlemen's Agreement" amongst themselves. The agreement can also be considered as a type of code of conduct for non-commercial and private sport fishing. According to the Gentlemen's Agreement, there should be no anchoring on Protea Banks (this issue is especially agreed upon concerning the shallower areas of the Southern and Northern pinnacles). Another important issue is that bottom or reef fishing should not be conducted. Additionally, a recreational fisherman is only expected to catch what he or she will eat himself. He or she can continue to fish, but should release any excessive catch rather than kill it. The fishermen following the described Gentleman Agreement will sometimes inform other users who are not following this code to change their behaviour. It is not law, but a voluntary choice of behaviour which the local fishermen prefer to follow. Unfortunately, there have been problems mainly during peak season in December with high fishing pressure and many fishermen temporarily visiting the area from other parts of the country. Many are unaware of the local Gentlemen's Agreement (Getz, 10/10/2005).

The divers have assisted recreational fishermen on occasions. One example is that if a fisherman has caught a Brindle (reef fish) and is not able to release it successfully because of it being inflated with air, the dive operator would take the fish back down to the reef for the fisherman (Getz, 10/10/2005).

6.4.1.3. Commercial fishing

One of the charter fishing companies operating in the area is also involved in commercial line fishing, additionally, and there are two other relatively small commercial companies. The main area for commercial fishing is normally further off-shore and deeper than where the recreational and charter fishing boats operate, meaning not directly at Protea Banks. The commercial fishermen will catch whichever fish they hook, but predominately focus on reef and bottom fish, and tuna. Sharks are not said to be a main

target for commercial fishing in the area surrounding Protea Banks, but they are caught from time to time.

Commercial fishermen are becoming more and more frustrated with sharks, mainly because, again, sharks attack their hooked fish, especially tuna. A 20kg tuna can be worth up to R300. Every tuna eaten by a shark before the fishermen can board the fish is loss of income. Commercial fishing has created jobs for many people, but the people in question depend on their catches and so see the sharks as a threat or enemy whilst fishing.

A desire for reduction of commercial fishing in the Protea Banks area has been expressed by stakeholders. However, they do not wish for a ban on the existing commercial fishermen to be proposed or implemented. They would prefer to rather have a scale out option where no more commercial companies are allowed to commence and establish themselves in the area, thus maintaining the current employment, but preventing an escalation of local commercial fishery industry.

6.4.1.4. Dive operators

There are several dive operators diving at Protea Banks sporadically, but only two main operators based at Shelley Beach that take divers out to the reef on a regular basis. The biggest operator has three boats but seldom operates at full capacity. Usually one or two of the boats are used per day. There are often days when there are enough divers to fill two boats, but rarely all three boats at the same time (10-20 days per year).

Commercial diving started at Protea Banks in 1994 with the establishment of one operator which is today the biggest and most active operator at Protea Banks. The operation was sold in 1999 as the owner at the time transferred to Mozambique. However, he returned to Shelley Beach shortly after and established another dive company. These two operators are currently the two main dive companies operating from Shelley Beach.

The first official dive at Protea Banks was conducted by the professional dive instructors Andy Cobb and Karen Trescher in 1992. The divers were taken out to the reef by a fishing charter which is now in conflict with one of the dive operators (further described later in this chapter). There was, however, dive activity previous to 1992, mainly spearfishing, but on a very infrequent and seldom basis. The first spear fishermen started diving Protea Banks in 1990 (Krull, 10/10/2005). The first divers at Protea Banks were met by great scepticism and they were considered very brave to dive with dangerous sharks. The divers brought with them spear guns or other defensive tools as they feared they could be attacked. The divers soon realised that the sharks did not attack them and stopped bringing the defensive equipment. It is now known that the sharks are not dangerous to the divers and there has never been any recorded incident of the sharks attacking or trying to attack divers at Protea Banks (Trescher, 11/10/2005).

The first dives at Protea Banks were described as being "packed with sharks". Today divers still see sharks, but many believe that there are much fewer sharks observed than earlier. There are various theories concerning the reduction of shark sightings. One theory is that the sharks have learnt to approach fishing boats for the purpose of feeding and have learned which boats to approach. Another presumption is that the sharks have learned that the divers are not food sources, and are thus not interested. The noise and movement of divers and their bubbles are believed to frighten away the sharks. One of the most mentioned theories of why fewer sharks are sighted during dives at the present time is the general increase in commercial shark fishery over the past decades (Fieldnotes, 2005).

Diving at Protea Banks is by many described as a high risk extreme dive. It is not considered an easy dive and the skippers and dive operators hold a very important role in being responsible for the safety of the diver. All divers must sign a personal liability form prior to the dive (as at any other dive site) so that in the event of an accident the dive operators cannot be held responsible or liable. However, the dive operators take safety extremely seriously. Safety is the number one issue in the dive briefing.

Two divers at Protea Banks (now several years ago), lost their dive group under water and drifted away, as they did not surface immediately to be picked up by the boat they were lost at sea. One of the bodies was later discovered in the area of Jeffrey's Bay. Divers have also been lost at Aliwal Shoal and drowned. The main difference between being lost during a dive at Aliwal Shoal as oppose to Protea Banks is the currents. The usual current at Aliwal Shoal will eventually take the diver back to the beach after a few hours. In contrast, the current at Protea Banks will usually take you out to sea and south (Fieldnotes, 2005).

The dive operators at Protea Banks are extremely safety conscious. When dive activity started at Protea Banks in the early 1990s the main concern was with sharks, but as previously mentioned, that view changed quickly. The real risks are the ocean and the weather conditions, along with, to a certain extent, diver inexperience, ignorance, and neglect of the rules pointed out during the pre-dive briefing. In order to ensure safe diving dive operators follow guidelines based on their experience and knowledge about diving, shark interaction and the conditions of the ocean. The different dive operators have slightly different approaches to safety, but with more or less the same basic principles (Fieldnotes, 2005).

The dive operators believe safety starts when a diver calls the operator to book the dive. In order to dive Protea Banks it is necessary to have a qualification equivalent to advanced open water diver level. If he or she diver has just an open water qualification, the number of dives should be at least 25. The dive master will in that case buddy with the least experienced diver. All the divers need to show their qualification cards or log books prior to the dive to ensure that their ability and skills are sufficient. Protea Banks is a demanding dive considering it is both a deep dive and a drift dive in usually strong currents (Muntz, 02/09/2005)

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The second safety measure, and maybe the most important, is the pre-dive briefing. Dive operators at other dive sites may not need to communicate such detailed information as the Protea Banks operators do before entering the water. At Protea Banks the challenges

and the code of conduct need to be explained in detail to ensure the safety of all divers, the dive operators and also to prevent damage to or the harassment of marine life.

Divers are thoroughly informed about the depth of the dive and the dive plan. The start location of the dive will either be the Northern or the Southern pinnacles, depending on the currents. The skipper needs to manoeuvre the boat through the surf which is usually relatively rough. The divers wear safety vests and put their feet under safety straps during this first part of the boat trip. When the dive site is reached (by GPS) and all the divers are ready, they enter the water and swim straight down to five meters. In other dive locations at the start of a dive it is common to gather around the buoyline held by the dive master before descending (called hot-tubbing), but due to the strong surface currents at Protea Banks the divers need to descend as fast as possible. There is a quick check at five meters ensuring that everybody is able to descend and then the divers meet at the bottom. The divers follow the current and drift after the divemaster in a close group.

The divemaster and the skipper have a method of communication in case a diver is separated from the group. The skipper gives three revs of the motor if a diver surfaces and is safely back on the boat, and the divemaster pulls the his buoy three times as a sign of receiving the massage. The divers are told to ascend immediately if they find themselves lost from the group. The divemaster will look for the missing divers a maximum of ten minutes and abort the dive if he has not received any confirmation from the skipper within that time. This is to ensure that divers do not get lost and go missing. Each diver is encouraged to carry an individual safety buoy in case of emergency so that they can easily be spotted by the skipper in rough seas. Both the skippers and the divemasters are experienced with diving at Protea Banks and are very professional. The maximum amount of divers per boat is usually 10. Due to the depth of the dive the maximum bottom time is 13 minutes. The rest of the dive is spent drifting over the reef and in midwater on safety stops, looking for sharks and other marine animals such as dolphins. The dive is usually between 30 and 40 minutes, but can extend if there is excessive shark activity during the safety stops (at 10-5 meters) (Muntz, 02/09/2005; Cobb, 01/09/2005).

In addition to the practical dive code of conduct there is code of conduct for interaction with sharks. One operator offers a specialised advanced shark course at Protea Banks which includes six hours of lectures, a lecture notes file and a number of dives. The course is a very good introduction and preparation for the dives and also serves to prepare divers. The operator has also produced a code of conduct for shark diving (see Appendix II for details, Cobb, 01/09/2005). The different species of sharks have very varying behaviour. The Ragged Tooth shark mainly stays in groups in caves and under hangs on the sea floor. At the Northern pinnacles there are two main caves which are visited at the beginning of the dive. The dive operators are very strict in following the codes of not harassing the sharks in any way. This year there have been sightings of over 500 Ragged Tooth sharks in just one dive. Other species of sharks, including the Zambezi sharks are usually spotted when conducting the midwater drifts. Divers do not follow the sharks, but rather try to stay as still as possible, allowing the sharks to come closer on their own accord (Muntz, 02/09/2005).

Protea Banks is one of the few dive sites in the world were divers can experience sightings of up to seven different shark species in one dive without the use of any chumming or feeding in order to attract sharks. Protea Banks is becoming well known as one of the best shark dives in the world, but there is concern that if the sharks are not protected from over-fishing Protea Banks might be known as the dive site that *was* one of the best shark dives in the world (Krull, 10/10/2005).

Protea Banks is historically a fishing area and only in recent years has it has become a dive destination. Targeted fishing of sharks might be unfortunate for the dive industry in the area (Cliff, 26/07/2005).

6.4.1.5. Whale and dolphin watching

There are organised whale and dolphin watching boats launching from Shelley Beach, but they do not focus solely on the Protea Banks area. There is one operator whom holds the official boat-based whale watching permit for this particular marine area and they can legally approach whales within 50 meters. There are other whale and dolphin operators

launching from Shelley Beach as well, but without licences and therefore having to follow stricter and different regulations. It is not uncommon for divers or fishermen to observe whales during certain seasons and dolphins while on the boat on the way to the reef (Fieldnotes, 2005).

Whale and dolphin watching legislation in South Africa is about to change drastically. Marine and Coastal Management (MCM) are currently finalising a policy on this type of tourism which will be drafted and available for public comment in the near future. The proposed new policy has recommendations towards changing the current regulations based on scientific information. At the time of the study the draft policy was not yet available (Oosthuizen, 21/11/2005).

6.4.1.6. Spear fishing

Spear fishing is not one of the major activities on Protea Banks; this is especially due to the often harsh conditions such as strong currents, not to mention the actual depth of the reef. However, some spearfishing does take place from time to time. Different species of reef fish are the main target for the spearfishing. Spearfishing at Protea Banks is also considered to some extent potentially dangerous because of the sharks. Hurt or bleeding fish will often attract the attention of sharks. One particular story from a spear-fisherman told of how he had to abort the spearfishing free diving at Protea Banks due to the presence of a high number of Zambezi sharks (Fieldnotes, 2005).

6.4.1.7. Non-governmental organisations (NGOs)

Another direct stakeholder specifically in connection with Protea Banks is the local NGO Sharklife. Sharklife was founded in 2003 by the second largest dive operator at Shelley Beach, in collaboration with another local enthusiastic shark diver and conservationist. The organisation has expanded to include an advocate, an environmental attorney and a person responsible for the web-site. Additionally, Sharklife now receives sponsorship from Wrigley's Africa and the NGO has several private members. Sharklife aims to promote and raise public awareness of the urgent conservation needs of sharks, and to

lobby towards the protection of sharks in South Africa and world wide (Trevor Krull, 10/10/2005).

A second NGO, also founded by a dive operator, is Andy Cobb Eco-diving. The NGO is associated with a big international NGO based in Germany called the Shark Project. The aim of the NGO is shark protection and raising public awareness. Andy Cobb is also very active in the South African society, promoting marine ecotourism and marine conservation in general (Cobb, 01/09/2005). Conservation and protection of the environment is very often initiated by passionate individuals or NGOs.

6.4.2. User conflict and potential solutions at Protea Banks

All the different user groups at Protea Banks, and all the other stakeholders and interested and affected parties in association with this marine area have their specific agendas. The marine scientists for example usually have a certain area of the ecosystem they focus on, the coral reefs, or a specific topic such as biodiversity. The conservationists (often through NGOs) have as their main element of the agenda to protect a certain or a selection of species, or an area. The commercial users of a marine area obviously normally care about the state of the environment in which they operate, which directly affects their fishing yields and financial income. The recreational users have a right of access to and use of the ocean, as the ocean is owned by the state for the use and benefit of the public as stated in the Sea Shore Act of 1935 (DEAT, 1998) .

The disagreement at Protea Banks is described as a classic user conflict situation where there are two parties with divergent views. One side is a fishing charter operator who occasionally wishes to catch sharks for their clients from time to time. The other side is a recreational dive operator who wishes to take their clients to see live sharks during dives on Protea Banks. The issue is localised and therefore could be considered as a minor subject from a conservation or management perspective. If there had been many repetitions of this type of conflict happening elsewhere on the coast it might be a bigger problem, but in reality it is very much a localised conflict. Unfortunately, as often seems to be the case with user conflicts, the situation has degenerated into a condition including

court cases, and this level of polarization has lead to the parties being further intractable, sticking to their own particular point of view. It might, therefore, be difficult to reopen any kind of line of communication.

One important principle of conflict resolution is actually to prevent a situation of disagreement leading to the stage of conflict. One of the problems is that there exists no legal framework for this specific situation for the authorities to intervene or regulate the disagreement. The relevant authority would be the MCM, but only if Protea Banks was a marine protected area. If it was an MPA then MCM could apply appropriate legislation and for example put in a prohibition on the capture of sharks in the area. However, no such legal framework exists for Protea Banks and the charter industry is not breaking any laws as long as they are following the bag limits. The shark species most relevant in the conflict is the Zambezi shark and any individual can legally catch one Zambezi shark per day. This bag limit has recently been revised from ten per day. However, it is unlikely that anyone would catch more than one Zambezi per day anyway, so the legislation does not really change the situation (Dudley, 26/07/2005).

Regulation of the dive industry in South Africa is a grey area. In fact there is no regulation placed upon diving sites outside MPAs. The clients are recreational divers, but the operators are running a commercial business. This makes it difficult in regard to a potential facilitation from the authorities regarding solving a local conflict. The MCM and their local KZN agency Ezemvelo KZN Wildlife could try to get the different parties in the matter into a dialogue and try to solve the problem. But it is not likely that either of the parties would change their views and compromise with some voluntary agreement of either the fishing company not to catch any Zambezi sharks on Protea Banks or for the dive industry to be persuaded that the catches of one or two Zambezi sharks a year is acceptable. The situation and its outcome depend on the number of sharks being caught and if that number of shark catches are significantly affecting the viability of shark diving tourism. It is difficult to come up with an immediate solution, but is quite clear that for the conflict is to be resolved an independent authority or party must intervene (Dudley, 26/07/2005).

Unfortunately there is a lot of personal bitterness expressed between the conflicting parties. The whole controversy might have been nipped in the bud if the authorities had stepped in many years ago, before the court cases and personal attacks had begun. So much has happened that it might be difficult now to get the parties involved to talk together and find an agreement, even though that would be a step towards a solution to the conflict. Unfortunately the authorities have chosen not to intervene and just allowed 'mud slinging' to a point where the conflict becomes very difficult to solve. Maybe this is a deliberate choice or perhaps the authorities are simply too busy (Cliff, 26/07/2005). The recent coastal policy White Paper for Sustainable Coastal Development for South Africa (2000) states that conflicts should be resolved if possible in a collaborative and analytical manner, optimally with consensus from all stakeholders. There might be a gap between legislation and its implementation.

The authorities responsible for solving local user conflicts should, in theory be the local authorities, but there might be a problem with their capacity and expertise in certain subjects. However, it is said that they should at least be seen to be concerned with local conflicts and the need for resolving them. Even though they might not be prime movers they should at least be part of it. Another authority that should have the right expertise is MCM's regional agent Ezemvelo KZN Wildlife.

There will always be differences in interests in a marine area as long as there are different user groups wishing to carry out different activities. Different interest and opinions can lead to disagreement, but not necessarily conflict, depending on how the situation is dealt with and, maybe most importantly, the personal character of the people involved. The media covered public conflict at Protea Banks is not a user group conflict between recreational divers and fishing boat charters, but a personalized conflict between the owner of one fishing charter and the owner of one dive operator. This conflict has a history of several years and has gone through various stages including court cases and negative comments in public, often in the form of statements from the operator's clients. The biggest problem with this particular conflict is the fact that it is now very personal and sensitive. But, it should be mentioned that media publicity is bringing both the parties

of the conflict more clients and therefore more business and financial income. An important aspect in this conflict, as mentioned previously, is the fact that shark fishing (within the bag limits) is not currently illegal. As long as there is a demand for recreational shark fishing and it is conducted within legal limits, nobody is doing anything wrong within South African legislation. Another complex issue, however, might be whether or not it is ethically correct behaviour to continue to fish for sharks. One of the stakeholders suggests a solution to the conflict could be brought about by the fishing charter agreeing to introduce a catch and release methodology into their shark fishing program. Instead of killing the shark and taking a photo of it on land, the fishermen could take a photo of the shark on the boat while tagging and releasing it. The potential tag and release program would then contribute to research and function as a self-monitoring plan, not to mention the positive publicity it might create. However, the personal conflict between the fishing charter and the dive operator may have contributed towards the opposite attitude, where collaboration and a consent solution are not reachable on a voluntary basis.

The user conflict concerning the shark issue might also be considered as a flagship for shark conservation and that is why a relatively small and personal issue has grown out of proportion. The charter fishermen sometimes say they are annoyed with the sharks and want to kill every single one of them, but that does not mean that they actually do so. Even before the introduction of shark bag limits they never used to kill many sharks even though they were allowed to. The conflict in itself could have underlying aspects of promotion, publicity and attention for both parties (Pradervand, 07/10/2005).

One activity or issue usually has many view points and the different view points are entirely justified in the opinions of the various user groups. One's opinion depends on what type of activity one is conducting or favour. It is still legal to catch sharks, but that does not necessarily mean that the law is not wrong. The problem might have originated in the fact that the fishermen see a high number of Zambezi sharks around their boats. The sharks might have learned through positive reinforcement and rewards through feeding on hooked fish, which is probably an easy way for the sharks to feed. The divers

see less Zambezi sharks. Maybe the reason is the charter boat activity. Not for killing the sharks, but by unintentionally attracting them towards their boats and away from the divers. The sharks might also feel threatened by divers if there are several divers diving simultaneously, producing many air bubbles and being potentially intimidating through their movements (Pradervand, 07/09/2005).

6.4.2.1. Other conflicts in association with Protea Banks

There are other conflicts that should be mentioned in association with Protea Banks and recreational fishing in general, in addition to that between the one dive operator and a charter fisher operator. Firstly, all the different fishing groups at Protea Banks seem to be in partial disagreement and distant with the law enforcement by the authorities such as EKZNW. There might be room for an improvement of interpersonal skills. Both parties in this conflict need to apply a professional approach, especially as one of the parties involved are responsible for the enforcement of law, and the others are the users of a marine public resource. The situation, however, has lately improved. Secondly, not yet a conflict, but definitely a situation heading in the direction of disagreement and antagonism is the feeling of disappointment towards the Government and MCM in terms of legislation and allocation of human rights (Pradervand, 07/09/2005). There is a general lack of confidence in the Government. The lack of belief in the authorities seems to relate to all the user groups.

6.4.3. Carrying capacity, seasonality and marine tourism management

There is a general and rapid growth in the charter boat fishing industry in KwaZulu-Natal (Pradervand, 2005). It is fairly easy to become a charter fishing operator, and at the current time there is no limit on the number of charter licenses issued per year. Licences are also issued completely independently of fishery considerations. Charter fishing is at the moment an open access commercial business. Commercial fisheries can have a potentially high impact on fish stocks, but in theory, overnight or in a limited amount of time, there might be a change from 96 charter boats to several thousands. And they will all be legal. There is a need for the charter boat fishery to become a controlled access fishery (Fieldnotes, 2005; Pradervand, 2005).

On one day around five years ago the number of fishing boats launched during the holiday peak season of December reached heights of "something like 160", but the numbers have decreased. Last year it was a more steady number of around 40 boats per day in December with 20 of them being charter fisher boats. The reasons for the decrease over the past couple of years is believed by some to be the increasing expenses of fishing, too many regulations and too many sharks (Milton, 11/10/2005). There may be a change in the type of boats, less private and more charter boats.

There are no limitations of the number of boats that can launch from Shelley Beach at any given time, but when the site is busy there are boats queuing to launch. The launching tower closes if the conditions are potentially dangerous, regardless of boats wanting to launch. During the peak/holiday season there tend to be minor conflicts mainly concerning the facilities and parking areas at the launching site (Zulu, 12/11/2005).

December is the busiest month for charter fishing with a high number of inland tourists travelling to the coastal areas for their holidays. There has been an increase in charter fishing operators from less than five fewer than two decades ago over thirty today. The charter fishers target any type of fish, including shark fishing and bottom or reef fishing. The type and species of fish targeted will eventually depend on the type of client a charter has that particular day (Fieldnotes, 2005).

The high increase in charter boat operators and the high pressure during peak seasons is of concern as stated by Pradervand (2005) but many other people at Protea Banks and Shelley Beach share the same concern. There is a need to investigate the maximum carrying capacity of the area in order to ensure both safety and enjoyment for the locals and tourists, in addition to ensuring economic, social and environmental sustainability. Such a decision must be based on stakeholders' knowledge and their consensus, in collaboration with scientific evidence and the relevant authorities.

The dive industry at Protea Banks is currently very small, and dominated by one very experienced operator. However, it is expected that the interest and number of divers will increase in the future as Protea Banks becomes more widely known and recognised, both internationally and within South Africa. At a dive site like Protea Banks experience and knowledge about the site specific marine environment is imperative for the divers' safety but also for enjoyment of the dive experience. Additionally, the dive operators' success depends on its professionalism. It might not be advisable to expand the existing local dive industry at Shelley Beach, at least not at present time. Divemasters who know the area from the local dive operators should continue to lead the dives at Protea Banks as their experience and knowledge about the reef is of extreme importance for safety (Fieldnotes, 2005).

The carrying capacity of divers at Protea Banks is not an issue at the moment as there is very limited activity and the operators follow a strict code of conduct. However, as a precautionary approach it might be advisable to set a limit in regard to the number of new operators wishing to establish businesses in the future (Fieldnotes, 2005).

As opposed to Protea Banks, Aliwal Shoal has and is experiencing pressure from increased diving, and will as a consequence from having been declared a marine protected area have a stricter management plan including permits concerning diving and other measures in order to control its carrying capacity. The management of Aliwal Shoal is much inspired by bigger marine protected areas such as the Great Barrier Reef Marine Park in Australia and the MPA flagship Bonaire in the Caribbean. Zoning based on different activities is one of the basic principles (Laurence, 22/11/2005). Zoning has its roots in the Recreational Opportunity Spectrum, which has resulted in various speciality spin-offs such as the Spectrum of Marine Recreational Opportunities explained in chapter 4 (Orams, 1999). Zoning is a management technique which allows for the opportunity to conduct various activities in an area while still controlling them and avoiding conflict. The management of marine recreational activities and tourism in KwaZulu-Natal is much based on a top down approach, and a more self-regulatory bottom up strategy is desired and needed (Laurence, 22/11/2005). Protea Banks is an example of self-regulatory

management where the stakeholders themselves have developed management strategies as codes of conduct and gentlemen's agreements based on their experience and knowledge of the marine area. This self-regulation can be considered to be very successful, with the exception of a local conflict as described earlier, and the huge influx of non-resident users during the peak seasons.

6.4.4 Protea Banks as a marine tourism resource

Shelley Beach is the most popular launch site on the South Coast of KwaZulu-Natal. The predominant activity is recreational fishing which must be considered as not only a big but also an important industry. Protea Banks is described as the best example of a big reef system along the KwaZulu-Natal coastline (Mann, 15/08/2005). It is a fossilized sand dune as are most of the reefs in this area, but one of the largest and most bio diverse representatives for this type marine environment. The reef itself at Protea Banks has not got colourful coral like for example Sodwana bay, but is attractive for divers due to the possibility of observing sharks and other large fish species (Cliff, 26/07/2005).

Protea Banks is, as mentioned before, mainly appealing to the more advanced divers due to the technical level and need for experience due to the sea conditions. The dive operators run their business to make a living and have to way up the pros of taking more divers and getting more money versus the chance of having an accident because they might have taken out an inexperienced diver. It makes sense to not let just anybody go diving at Protea Banks and to apply firm safety restrictions. Some days the conditions can be beautiful and a not too difficult dive. Other days the current can be strong and the visibility low and there might be a layer of dirty water on the top which is making it very dark on the bottom, and there might be quite a few Zambezi's around. Novice divers can get agitated by the sharks and the rough conditions and the chance of something going wrong during the dive increases. These facts might be reason for the implementation of some form of regulation. However, it would have to be self-regulatory management. To have someone from the Government paid to go to Shelly Beach and check diving qualification and how many dives individual divers have undertaken sounds good in theory, but is totally implausible and will never happen (Cliff, 26/07/2005).

The legislated authority and marine manager organization in KZN is Ezemvelo KZN Wildlife (EKZNW) who are responsible for monitoring shore patrols and conducting boat inspections. The EKZNW uses various techniques for patrolling the marine areas, monitoring and compliance. One method is walking up and down the beach, checking the anglers' licenses and catches. Boat inspections are conducted to check the boat fishery. Access point surveys are also performed. The staff will position themselves at the access point, wait for the boats to come in and they will inspect the catches. Similar information is collected on shore patrol. The Oceanographic Research Institute (ORI) in collaboration with EKZN and Marine and Coastal Management (MCM) collect data information on all launches along the coast and monitor fish catches. Each launch is registered along with each boats catches. Additionally a two year study on the charter boat industry has been finalized by ORI as described previously, commissioned by MCM in order to better understand the charter boat industry and its negative and positive impacts and level of environmental pressure (Pradervand, 07/09/2005).

The value of recreational fishing has quite possibly been underrated in South Africa. Other countries in the world, mainly North America are well aware of the financial benefits of recreational fishery, with both direct and indirect financial multiplier factors. Additionally they quantify the social value of recreational fishing, the enjoyment and relaxation. South Africa appears to be lagging in quantifying the social and spiritual value of boat fishing, shore angling and spear fishing. There is a need to quantify the intrinsic value of fishing, such as for example the intergenerational links between father and son going fishing, like his father and grandfather used to do (Pradervand,07/09/2005).

The spiritual value of recreational fishing is very difficult to describe. One of the stakeholders explains it as a feeling of marine wilderness and being out in nature. The ocean in itself and being on a little boat makes you feel small and overwhelmed by the environment surrounding you. From the fishing boat you might observe different fish, such as flying fish, or marine mammals such as whales and dolphins. As you become more experienced as a fisherman you increase your knowledge about the different species and fishing techniques, experiencing what can be described as a positive self realising

sensation. Fishing is further described as a leveller between people of different classes or parts of society. Your education or work title becomes insignificant while out on the boat fishing. Recreational fishing is described as both relaxing and exiting. The comfortable climate in South Africa adds to the recreational fishing experience in a positive manner (Milton, 11/10/2005).

The direct economic value of recreational fishing for Shelley Beach is very high. And, if conducted in an ethically correct and sustainable manner, recreational fishing is an important tourism sector for KwaZulu-Natal. Recreational fishing creates employment and income for people living on the South Coast. Commercial fishermen must catch a certain amount of fish for their endeavour to be economically viable, while a charter fishing company has already made its money while launching the boat, whether there will be any fish caught or not. However, it is assumed that charter boats are often catching too many fish and over exploiting fish as a resource which in turn leads to reduced sustainability. The skippers are often very experienced and know exactly when to go and where to catch the most fish (many are also ex-commercial fishermen). The concept or theory that you are fishing to your ability disappears when using a charter fishing company (Fieldnotes, 2005).

6.4.5. Shark management and lack of scientific research at Protea Banks

The international shark population is supposedly in decline, mainly through the demand for fins and long line fishing (Cliff, 26/07/2005). In South African fisheries sharks have traditionally been regarded as trash species. If a shark was caught the fisherman would usually just throw it back and or kill it. This has been the traditional view on sharks whether it was shore fishing, estuary or boat fishing. However, the value of sharks is increasing. There is a demand for shark products, especially from Australia and Asia. The South African population is not yet interested in shark products, but it is unsure what the future might bring. The value of sharks for recreational fishermen also seems to be increasing.

In KwaZulu-Natal the juvenile Dusky sharks are a very popular target around spring time. Many people are coming to the coast to fish for Dusky sharks each year, and the general interest seem to be increasing. Recreational sport fishing specifically for sharks is considered to have the potential to increase in growth in the future, but its development depends on upcoming regulations from the authorities. Shark fishing is fishing for an apex-predator and it must be conducted ethically as sharks are now known to be vulnerable for over harvesting. It is said that there might be a potential for increased growth in the recreational shark fishery, but it must be handled professionally, using the right tackle so that the shark can be released as fast as possible. The killing of sharks should not be promoted. This type of shark fishery is ecologically unsustainable and of high risk to shark populations as a whole as most shark fisheries around the world experience an initial high catch followed by a typical decline, until there are no more sharks to catch. Commercial fishing pressure on sharks is definitely increasing, and should be addressed (ref. Anonymous).

Recreational shark fishing in general has changed due to both ethical and conservational reasons. The promotion of catching, for example, a big Tiger Shark for the purpose of its jaws as a trophy is no longer common. However, recreational charter fishing targeting sharks for the purpose of (tag and) release is said to be a potential business development option. This type of operations is found several places in the Northern Hemisphere, run by highly qualified and professional persons with suitable equipment and adequate know-how. Tagging has the potential to be an additional activity for fishermen, but might be a problematic action as well. It is imperative that the tagging is conducted correctly, as its purpose is scientific data collection. It might rather be better with less, but correctly tagged fish. Tagging should be left to professionals and maybe very dedicated charter operators who have extensive fishing and tagging experience and work in conjunction with scientists (ref. Anonymous).

One of the main strategies for shark management in KwaZulu-Natal is the shark nets put up for the protection of swimmers after a series of shark attacks in the middle of last century, managed by the Natal Sharks Board. Shelly Beach has no shark-nets, but the

nearby beaches of St. Michaels-On-Sea, Uvongo and Margate have all been netted since the 1960s. The negative effect of the shark attacks on coastal tourism during the late 1950s in this area lead to the installation of shark nets. The number of shark nets has over the past year been reduced (Dudley, 26/07/2005). The shark nets are very controversial as they kill many sharks, but also other marine animals annually.

Andy Cobb states: "*Since union whaling was shut down and all resident sharks killed by the shark nets that had been attracted there by such a grand feeding station, the nets are no longer required to protect the recreational beaches since 1986. It is only public perception that keeps the nets in place. There are many beaches without nets that have bathers and surfers - where are the shark attacks?*" (Andy Cobb, 30/07/2005, NAUI Advanced Shark Course Notes).

The local NGO Sharklife and Andy Cobb's NGO both use the media as a method for raising awareness concerning the need for protecting sharks. There have been several attempts to try to get Protea Banks recognised as a marine ecotourism resource, but there have been no specific results so far. However, one action that should be mentioned is that the shark fishing competition that used to be held every December has ceased to exist. The conservation of sharks seems to in many cases amount to the involvement of a group of passionate people who get personally involved in shark conservation issues. Techniques involve contacting the authorities and providing information of environmental concerns, such as the decrease in number of sharks observed per dive over time. Increasing general public awareness of the need for protection of sharks is another issue which is very important for both NGOs and dive operators. All things considered, the power of protecting sharks from over-fishing lies with the government who produce the fishery and marine conservation legislation. The legislation should in theory reflect the people opinions and current scientific knowledge. If there is enough pressure from the public, and NGOs, concerning the need for shark protection, and scientific study shows a decline in shark numbers, the logical result would be the creation of a set of new shark management laws. However, there is a controversial conflict between the frequency and abundance of sharks and the beach tourism industry in KwaZulu-Natal. Economic considerations and safety for bathers compete with the instinct value of sharks as apex

predators and regulators of the ocean. The danger, nevertheless, is that if it is discovered that certain shark species are threatened as a species, it might already be too late to reverse their extinction (Cobb, 01/09/2005;Krull, 10/10/2005).

There is definitely a gap in shark research in South Africa. The main research focus has been on the shark net catches in KwaZulu-Natal and recently the Great White Sharks in association with cage-diving. There are also some studies focusing on Ragged Tooth sharks, mainly at Aliwal Shoal (Lawrence, 22/11/2005). These research areas are of utmost importance, but they do not represent the full shark population in South African waters. The majority of shark species seem to be relatively localised during certain periods of the year, with seasonal migratory patterns. There is a need for further shark research in South Africa, but also internationally in order to produce a sustainable management of the world's shark populations. There are some international and national initiatives as mentioned in previous chapters, but there is still a need for further scientific knowledge. The majority of shark research is biological research on caught (dead) sharks or the results of shark fishery. More behavioural studies need to be supplemented in order to obtain a full understanding of the various shark species (Fieldnotes, 2005).

Dive operators at Protea Banks register their shark observations during their dives. Their registrations include gender, frequency and abundance over time and seasons, behaviour and interactions between divers and sharks. The dive operators' consistent observational registrations could be the bases for further studies and a benchmark for the development of indicators that could be measured over time to investigate trends in shark behaviour, frequency and abundance.

6.4.5.1. Shark chumming and feeding for the purpose of dive experiences

Some of the stakeholders express concern about the increase of shark feeding by dive operators. The concerns are specifically directed at two operators in the waters between Aliwal Shoal and Protea Banks who conduct Tiger shark feeding for the purpose of shark diving. On one side there are people worried about the potential altering of the sharks' behaviour. From any form of shark attraction there will inevitably be direct interference

with shark behavioural patterns, whether it is taking away their time from hunting or energy for other activities. There will in some way be distraction from their normal behaviours. Divers should just be observers, and watch the wild marine animals rather than interfere and potentially disturb.

Other stakeholders claim that the feeding of pelagic sharks will not affect individual sharks as sharks are migratory and need to repeat behaviour regularly in order to learn, or for feeding and chumming to work as positive conditioning. The discussion of feeding sharks for the purpose of attracting them closer to divers applies also to the Great White shark cage-diving industry. Some claim that sharks learn to associate food with humans, thus creating an increased potential for shark attacks. Others claim that as long as chumming and not feeding, is done in a controlled manner, shark behaviour is not manipulated or adapted.

A more direct concern is the potential danger for divers to be hurt during shark feeding dives. This issue relates specifically to the Tiger shark diving close to Aliwal Shoal and Protea Banks. Even though the sharks would not deliberately attack the divers, there could easily be accidents. Protea Banks is on the other hand different to the above discussed dive activity. At Protea Banks there is no feeding or chumming of the sharks involved, but rather a chance to experience the sharks' natural behaviour and to observe them with respect as wild animals (Fieldnotes, 2005).

If a marine animal, Tiger sharks in this case, were to physically hurt or injure a diver, diving would be negatively affected, as would the implicated animal. The shark will be blamed even if its behaviour could be linked to harassment or aggressiveness due to arranged feeding. There are no specific laws concerning the feeding of marine wildlife outside MPAs (Laurence, 22/11/2005).

6.4.6. Protea Banks and marine protection

To declare an area a marine protected area (MPA) there needs to be a transparent and properly evaluated process conducted involving all the stakeholders and affected parties.

That is one of the most important issues concerning an MPA. The study shows that many stakeholders consider that the declaration of Aliwal Shoal as a MPA is an example of how MPAs should *not* be declared. A true marine protected area is first and foremost a conservation area with either banned or strictly regulated exploitation of marine organisms. The idea of MPAs is to establish refuge areas where marine organisms are safe from exploitation. The primary motivation for protecting Aliwal Shoal on the other hand was to provide a framework for management of the dive industry because there was no such framework for diving in non-protected areas. In that sense Aliwal Shoal is not a true MPA, and MCM has actually acknowledged this fact. The majority of recreational and commercial fishing still continues except from a specific crown area within which most of the diving takes place. A small number of species have been placed on a restrictive list and a very small number have been classified as off limits to fishing (Fieldnotes, 2005).

The shark-nets off Scottsburgh and Park Rynie were declared illegal without any consultation with the Natal Sharks Board (NSB). Several other stakeholders were also excluded from the decision making process. The issue of beach users in this area wanting shark-nets were for example, not considered. The shark-nets have been there for over 30 years, while the dive industry in the area has existed for about 10 years. However, the NSB as a public service provider contacted Marne and Coastal Management and an exception from the regulations was made to keep the nets in the area, in order to not potentially loose tourists to other holiday destinations in the area with shark nets (Dudley, 26/07/2005).

If the public is not involved in the process of decision making within the frame work of the authorities intentions, then the public will resent the authorities and their decision. If a decision is made to make Protea Banks into an MPA and off-limits to fishing, the charter fishing industry in the area needs to be informed why the decision is being made, and they need to be convinced that what they are doing represents an unsustainable activity or an activity that is having a significant effect on another sector of the economy, such as recreational diving. Proper investigation, consultation and analysis by the authorities in a

transparent process are necessary to establish a marine protected area (Dudley, 26/07/2005).

In theory it appears sensible to declare Protea Banks as an MPA, but in practice it may be ill advised. The area is a very important and historical area for fishermen, and there would therefore need to be investigation into whether there would be alternative fishing areas to offer. The reef is deep and attracts much fish. It is a small area in which both fishing and diving occur and some sort of zoning might be useful. However, that would have to be on a voluntary basis as it would be very difficult to police. It would have to be a voluntary agreement between the fishermen and the divers (Cliff, 26/07/2005).

To establish a MPA just for the purpose of solving a user conflict is not a good criterion on its own. The criteria should be related more to fish species or other marine life on the reef that needs protection. Aliwal Shoal which has just been protected is not identical but very similar to Protea Banks and in close proximity, and therefore reduces the importance of protecting Protea Banks. Protecting a limited area also has limited advantages. Some fish are very local and stay in one place, other will move around. Even if everybody would follow a no fishing law on the reef, they could fish on the edges and actually catch a lot of fish living on the reserves (Cliff, 26/07/2005).

Protea Banks is a relatively small area. It might actually be a too petite an area for both a detailed zoning plan strategy and for being a marine protected area (MPA). The study has shown that there are already existing self-regulatory initiatives by the stakeholders at Shelly Beach and Protea Banks. The codes of conducts and gentlemen's agreements, as described previously, are successful and should continue to be used for the purpose of managing the different activities at Protea Banks. A sort of zoning exists in the sense that the fishermen do not fish over the northern and southern pinnacles of Protea Banks.

Protea Banks is situated 8 km off-shore and classed as a semi-remote marine area (Orams, 1999). Remote areas are expensive and difficult to police, and self-regulation is the most useful management approach. There might not be a need to legislate the code of

conducts, but the use of techniques such as signage and posters to make marine users who are non-resident aware of the guidelines is advisable and preferred by the stakeholders (Fieldnotes, 2005).

The existing stakeholder guidelines provides for partial protection of the reef. Divers minimise their impact on the marine environment while ensuring diver safety. Recreational sport fishermen fish what they eat themselves, and avoid vulnerable reef or bottom fish. The charter boats, however, are very much controlled by the recreational fishing demand. Public awareness and information is imperative for the future sustainability of marine resources. Especially concerning sharks as there is an evident gap in shark research.

7. CONCLUSION AND RECOMENDATIONS

7.1. Concluding remarks

The study has reached the aim of providing recommendations towards a site specific management plan for Protea Banks as a marine tourism resource based on the stakeholders' opinions. Objective 1, 2, 3a and 4 have been responded to in detail based on the opinions of the stakeholders expressed in the semi-structured in-depth interviews of key representatives. Objective 3b concerning user conflict proved to be a very personal affair between two users. In order to protect the people involved, and as a result of the primary data collected, the focus of user conflict expanded to include other and less private stakeholder conflicts at the study area. The *expected* results from objective 5 were the opposite of the *actual* results as the majority of stakeholders were actually against the idea of a marine protected area at Protea Banks. It would be an interesting and recommended future study to further look into alternative marine environmental protection strategies for Protea Banks as a marine tourism resource and as a value in itself as a marine ecosystem.

Marine tourism in South Africa has a unique potential based on the wide variety of marine resources and the many marine tourism activities available. Marine tourism in South Africa is still conducted on a relatively small scale, with the possibility of creating a sustainable industry before potentially irreversible negative impacts occur. It is important to provide for a fair spectrum of marine recreational opportunities. The activities must be managed sustainably to ensure that they will be available to enjoy in the future as well as the present.

7.2. Recommendations towards a site specific management plan for Protea Banks

The results from the stakeholder interviews show a range of concerns from different user groups. The recommendations towards a site specific management plan are based on these concerns and other opinions stated by the stakeholders. The recommendations are as follows:

- *Create a forum consisting of the direct stakeholders for the purpose of friendly collaboration and discussion.* A forum that can deal with potential present or future managerial, environmental, economical or other issues with consensus from all stakeholders.

- *The vast majority of the stakeholders are not in favour of declaring Protea Banks a Marine Protected Area, thus this action is not recommended.* However, there are other marine conservational concerns that could be discussed and put forward to the relevant authorities through a forum.

- *Use the existing Code of Conduct as self-regulatory instruments.* There are several existing Codes of Conducts developed and used by the user groups. These could be registered (consensus needed by all stakeholders) and used as a display at the launching site to inform occasional users of the various codes (for example the sport fishermen's gentlemen agreement and the dive code of conduct concerning shark interaction).

- *Codes of Conduct for the different marine activities at Protea Banks could be printed out and made available* at the launching site, the Internet and other distribution sources to raise awareness of the local user guidelines.

- Some of the fishermen have started to dive out of curiosity and general interest in the ocean. This *cross of activities could be positive for all the different user groups*. The fishermen experience large amount of sharks around their boat while fishing. It might be of interest for divers and other marine tourists to join the fishermen for a day and observe sharks from the boat. This might also inspire to a closer relationship, understanding and collaboration between the different users.

- There is no set carrying capacity or limited number of boats that can go out to the Protea Banks at any time. Concerns have been expressed by different user groups. *There is a need for a set carrying capacity, especially during peak*

seasons. There is need for research in order to establish the sustainable limit of users. The user priority should be given to the existing and established users.

- There are no scientific studies specifically on Protea Banks. *It is recommended that further site specific studies on the marine environment, socio-economic environment and management of Protea Banks is conducted with focus on the interest of the direct stakeholders.* The cost of the study, however, is a problem. Potential financial support could be found in the form of private-public collaboration, with input from aquariums, research organisations, authorities, NGO's and other private companies and organisations.

- There is a significant gap in shark research in South Africa. *It is recommended to conduct studies specifically on sharks*, their abundance and behaviour and the general state of the South African Shark species.

- *There is a lack of marine tourism research in South Africa and further studies are needed* in order to both obtain baseline data and to ensure future sustainability of the marine resources.

7.3. Final Comments

The controversial topic of sharks in South Africa, especially in association with marine tourism, needs to be addressed with further research. The gap in scientific research needs to be filled in order to better understand the state of the South African shark populations and the need for potential conservation initiatives. Specific shark behavioural studies are recommended, in addition to shark and diver interaction.

Protea Banks is a unique dive site and recreational fishing location with many devoted user groups. Many of the users are very experienced and professional in for example diving or sport fishing and have valuable knowledge about the area. This knowledge must be considered in Protea Banks management and can also assist in further research. At present time there is no specific legislation but various guidelines or code of conduct

based on the users' experience. If there will be specific legislation in the future for Protea Banks, its principles need to be set by its users and direct stakeholders, in collaboration with marine scientists.

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APPENDIX I

LIST OF INTERVIEW PARTICIPANTS

1	26/07/2005	Sheldon Dudley	Natal Sharks Board Biologist
2	26/07/2005	Geremy Cliff	Natal Sharks Board Senior Scientist
3	15/08/2005	Bruce Mann	Oceanographic Research Institute Senior scientist.
4	07/09/2005	Pierre Pradervand	Oceanographic Research Institute Scientist
5	01/09/2005	Andy Cobb	Andy Cobb Eco Diving NGO
6	02/09/2005	Roland and Beulah Muntz	African Dive Adventure, owners and managers
7	10/10/2005	Trevor Kull	African Odyssea owner and Sharklife founder
8	10/10/2005	Anton Getz	Shelley Beach Ski Boat Club leader
9	11/10/2005	Karen Trescher	Dive instructor
10	11/10/2005	Laurence Viljoen	Dive Master
11	11/10/2005	Denise Milton	Sensational Fishing Charters owner
12	12/11/2005	Sibisuso Zulu	Launch Tower operator
13	16/11/2005	Michael Schleyer	Oceanographic Research Institute Deputy Director
14	21/11/2005	Herman Oosthuizen	Marine and Coastal Management Marine Scientist
15	22/11/2005	Cloverly Laurance	Ezemvelo KZN Wildlife Marine researcher

APPENDIX II

DIVING WITH SHARKS CODE OF CONDUCT USED AT PROTEA BANKS BY ANDY COBB, ANDY COBB ECO DIVING.

Shark Diving Code of Conduct

DIVING RESPONSIBLY WITH SHARKS.

Observe – Do not disturb

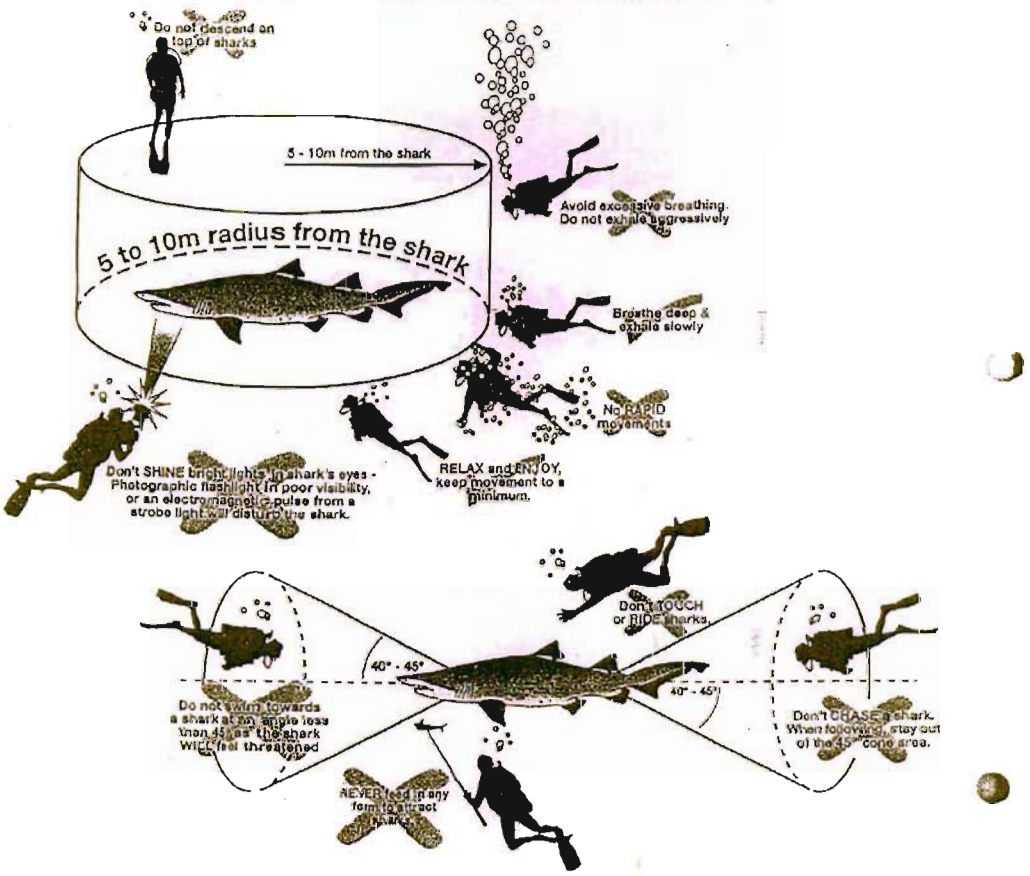
- Shark divers will abide by all national, regional, local conservation laws and regulations.
- Shark divers will also abide by regulations and requirements of their controlling body.
- Avoid diving in unsatisfactory conditions with shark i.e. low visibility (less than 5-metres), unusual marine activities such as the sardine migration etc.
- Avoid descending on top of the sharks
- Relax totally and reduce excessive breathing. (Maintain steady breathing and swimming rhythm). No sudden movements
- Settle down on the sand and remain out of the shark's own COMFORT ZONE: Note the sharks' swimming pattern and OBSERVE the natural distance the sharks adapt to your presence and maintain the same distance. This is different with varying degrees of visibility and previous harassment.
- Avoid swimming towards a shark at an angle less than 45 degrees as the shark feels threatened.
- When passing a group of resting sharks in a current, pass above the sharks at a minimum of 5 m, but do not hover over the group.
- Keep out of the caves, gullies, caverns, sandy patches and overhangs, where the sharks are resting.
- Camera operators to stay out of the shark's space i.e. approach cones and rest areas for photographs. Photographers need to be accepted by the shark as the sharks will adjust their space and come closer for photographers. Video cameras are best.
- Do not block the sharks' exits or wedge the sharks towards the reef.
- Do not TOUCH or RIDE sharks.
- Do not CHASE a shark or sharks, as this is direct harassment. Following a shark at its own pace and rhythm requires respect of the shark's comfort zone also important for you to be visible, to the shark. Stay 5M to 10M behind, slightly higher and to one side, in order to be visible.
- Do not SHINE bright lights in the sharks' eyes. Photographic flashlight in poor visibility will disturb the shark. Caution the electromagnetic pulse from the strobe light can also give the shark a fright.
- NEVER FEED or use bait, or by-catch to attract sharks.
- The sharks are often inquisitive. Should a shark approach, keep still, do not use hands to maintain buoyancy and ENJOY the privilege. Do not invade its space. Breathe slow and easy, a sudden exhalation will disturb a naturally inquisitive shark. Any reaction by divers to an inquisitive shark's presence will also disturb the shark.
- A fast moving shark CAN be an nervous investigative shark. Stay together and move with a slow and steady rhythm, keep relaxed and move away if necessary. Do not invade its space.
- At all times there must be a total respect of the shark, view and enjoy so that they are undisturbed for the next group to enjoy. Sharks are masters of their environment, we are not in their food chain, but at the same time do not want to trigger undue attention, by provoking a shark. Respect means understanding the marine rhythm and blend with the sharks environment.

Prepared by: Andrew C. R. Cobb.

Reviewed by: Dr. Erich Ritter

DIVING RESPONSIBLY WITH SHARKS

Observe - don't disturb



1. Keep out of the caves, gullies, caverns, sandy patches and overhangs, where the sharks are resting.
2. Don't block the shark's exits or wedge the shark towards the reef.
3. RESPECT the shark's space and approach cone limitations to be accepted for a memorable encounter.
4. The sharks are often inquisitive. Should a shark approach, breathe slow and easy, keep still, do not use hands to maintain buoyancy and ENJOY the privilege.
5. A fast moving shark can be an agitated shark. Stay together and move with a slow and steady rhythm, keep relaxed and move away if necessary.
6. Respect and enjoy the shark, view so that they are undisturbed for the next group to enjoy.
7. Sharks are masters of their environment, we are not in their food chain. Respect means understanding the marine rhythm and blend with the shark's environment.

Prepared by: A. C. R. Cobb Artwork by: TECHNO OCEAN Reviewed by: Dr. Erich Ritter