

Interpretation to manage marine recreational resource use in Mombasa, Kenya

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Abstract. The ultimate goal of natural resource management is for the resource users to engage with the resources in an environmentally responsible manner. Interpretation is one tool that can be used to influence the actions or inactions of resource users, and thereby manage those resources. There are numerous components to effective interpretation and provision of information is but one of these components. Prompting users to take action and providing the opportunity to take action are other vital components. Furthermore, an understanding of behaviour and behaviour change can guide interpretation efforts so that they are effective in influencing behaviour. All these components can easily be incorporated into snorkeling excursions. This research project used an understanding of behaviour and behaviour change to determine the most effective interpretive messages and then tested the efficacy of this interpretation with recreational marine resource users (snorkelers) in the Mombasa Marine Park. These key messages were incorporated in a training workshop for all the glass boat operators and associated crewmembers that resulted in these operators using an interpretation program as part of their excursions. Preliminary results suggest that the introduced interpretation program was successful in influencing the snorkel behaviour of participants and also in conveying informative messages to the participant. Crewmembers were responsible for effectively transmitting this information.

Key words: Resource use, Interpretation, Snorkeling, Marine park, Mombasa.

Introduction

Hammit and Cole (1987) define recreation as an activity that “offers a contrast to work-related activities and that offers the possibility of constructive, restorative and pleasurable benefits (p.3).” When these activities use natural resources one speaks of recreational resource use. How recreants use a resource depends on the physical quality of the resource (Bramley and Carter 1991). High-quality resources will cope with high levels of resource use, and this in turn is a major factor determining the amount of impact that this resource receives (Hammit and Cole 1998). When recreants use resources they create impacts (Bramley and Carter 1991; Kimmel 1999; Madin and Fenton 2004), even if the resource use is thought to be minimal (Hammit and Cole 1998; Leung and Marion 2000; Marion and Reid 2007). As nature-based tourism is steadily increasing within the tourism industry (Orams 1995; Orams 1996; Buckley 2000; Madin and Fenton 2004), both resources and resource users must be managed (Marion and Rogers 1994; Hammit and Cole 1998). Interpretive programs are a potential means of achieving this management.

A management tool often used to protect resources is that of a protected area (Brown, Adger et al. 2001; Pomeroy, Parks et al. 2004; Cinner 2007). Marion and

Reid (2007) assert that protected areas need to find the balance between sustaining resources and offering recreational experiences. The physical and regulatory mechanisms comprise the majority of visitor-wildlife interaction. However, the educational (interpretive) mechanism is capable of increasing its presence in managing this interaction (Orams 1996), yet this has seldom been researched to validate its efficacy (Orams 1997; Luck 2003; Pomeroy, Parks et al. 2004).

Marine recreational resource users interact with marine wildlife through a variety of means and these activities bring with them the following threats: snorkel and scuba diver damage; trampling; crowding; fish-feeding; boat anchoring; destructive fishing and physical contact with aquatic wildlife. (Woodland and Hooper 1977; Kay and Liddle 1989; Neil 1990; Hawkins and Roberts 1993; Marion and Rogers 1994; Davis and Tisdell 1995; Allison 1996; Harriott, Davis et al. 1997; Roupael and Inglis 1997; Hawkins, Roberts et al. 1999; Plathong, Inglis et al. 2000; Barker and Roberts 2004; Luna, Perez et al. 2009).

There exists a consistent theme expressed by numerous authors that the success of resource management must include an increase in public awareness (Kerr 1991; Orams 1996; Orams 1996; Hammit and Cole 1998; Agardy 2000; Young and

Temperton 2008). This need was already apparent more than two decades ago (Olson 1984) and can best be delivered through nature interpretation (Alcock 1991). Interpretation can be delivered in a variety of forms but the underlying goal is to increase the awareness of the resource user pertaining to the natural resources and sustainable interactions with those resources (Forestell 1990; Jacobson and Marynowski 1997; Tanner 1999; Manning 2003; Ballantyne and Packer 2005). Interpretation supplies the resource user with adequate information concerning the problems, solutions and surrounding facts that can then be used by the resource user when he/she decides on how to interact with that resource. Ultimately it can be used to change resource user behaviour into pro-environmental behaviour that does not have a detrimental impact on the resource (Orams 1996; Jacobson and Marynowski 1997; Ballantyne and Packer 2005). Interpretation has also been shown to be effective in increasing visitor enjoyment (Orams 1996; Luck 2003). Both reasons are of paramount importance as tourism, and more specifically nature-based tourism, is increasing in numbers (Orams 1996; Buckley 2000; Madin and Fenton 2004). In addition, studies have shown that resource users are receptive to interpretation and exhibit a desire to increase their understanding of the environment through the acquisition of information (Luck 2003).

The knowledge gained from such interpretive programs will guide the visitor to interact with the natural resources in a sustainable manner and reduce inappropriate behaviour (Orams 1996; Aiello 1998; Howard 2000; Ballantyne and Packer 2005). The need for interpretation in the marine wildlife tourism sector is three-part: (1) interpretation can be a means for managing tourist-wildlife interactions; (2) the education component of interpretive programs can influence tourist attitudes and behaviour; and (3) quality interpretation can enhance visitor satisfaction therefore contributing to the economic viability of the tourist operation.

Interpretation programs already exist in numerous (marine) protected areas but few have been evaluated for effectiveness and a need exists for further research into the role that these interpretation programs play (Orams 1997; Luck 2003; Pomeroy, Parks et al. 2004). Interpretive programs require careful design and implementation in order for them to be effective. An understanding of the learning process and the underlying behaviour theory is crucial so that interpretation campaigns can be directed in an effective, enticing and efficient manner (Orams 1994; Orams 1996; Orams 1997; Tanner 1999; Darnton 2008), and result in behaviour change to assist with resource protection and conservation (Petty, McMichael et al. 1992; Orams 1997; Ballantyne, Packer et al. 1998; Hammitt and Cole 1998; Tanner

1999; Thogersen and Aarhus 2007; Darnton 2008). Interpretation programs must target specific mental processes for behaviour change to be successful (Orams 1994; Orams 1996). To date, minimal research has been completed linking environmental awareness and behaviour (Orams 1996; Tanner 1999). This has resulted in a gap which has been apparent for several decades (Olson 1984).

This study examined the efficacy of an interpretation program designed specifically for the recreational snorkeling resource users within the Mombasa Marine Park and Reserve. Visitor impact and experience were assessed. The goals of the interpretation program included decreased impact on the reef and enhanced visitor satisfaction.

Material and Methods

This study was conducted in the Mombasa Marine Park and Reserve, Kenya (see fig 1). A pilot study, main study and training workshop were the key components of this study.

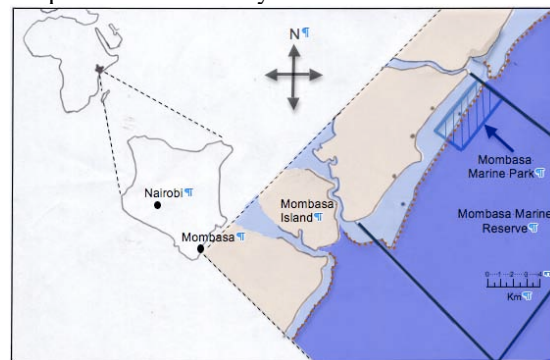


Figure 1: Map of the Mombasa Marine Park and Reserve, in Mombasa, Kenya.

Pilot Study

A pilot study was conducted to discover the salient beliefs of the resource users in the study area. Snorkelers were followed for a period of 7 minutes and their interactions with the coral reef were recorded (n=58). Interactions included touching living or dead substrate either intentionally or unintentionally, handling wildlife, causing the bottom sediment to become suspended and standing comfortably or uncomfortably on either living, dead or sea grass substrate. Snorkelers were then interviewed verbally with 8 pre-set questions concerning their beliefs (behaviour, normative and control beliefs) about not disturbing marine life whilst snorkeling. These responses were compiled and used to identify the salient beliefs.

Main Research

The core research component involved gathering data regarding a resource users behavioural intent, actual snorkeling behaviour and his/her experience. At the start of a glass boat snorkeling excursion a visitor was

asked to complete a questionnaire. This questionnaire contained questions about the participant's beliefs, attitudes, behavioural intent and prior knowledge. This questionnaire was completed before any resource interaction occurred. Upon arrival at the snorkeling location the participants were followed in the water during the snorkeling portion of the excursion and their interactions with the coral reef were recorded (as described above). Upon completion of the glass boat excursion the participants were asked to complete a questionnaire about their experience throughout the excursion. When sufficient data had been collected (PRE group, n=123) a training workshop was conducted for the glass boat operators. Following the workshop, the methods were repeated until a similar sample size was collected (POST group, n=152).

Training Workshop

A three-day training workshop was conducted for all the glass boat operators and associated crewmembers (n=103 representing 25 glass boats). This training workshop focused on introducing interpretation to the glass boat excursions to reduce the environmental impact and enhance clientele satisfaction. The workshop targeted the salient beliefs identified by the pilot study. The workshop consisted of expert presentations, various discussion groups and role-playing scenarios. One of the major outputs of the workshop was a code of conduct developed by the operators themselves. Upon successful completion of the workshop, each boat was presented with the following materials to use on their glass boat excursions (A3 flipchart for presentations, underwater ID slates, branded polo shirts, professional salesman folder and participant manuals including all the presentations and additional information).

Statistical Analysis

Chi-squared tests were used to compare the differences in behavioural intent and visitor experience between the PRE and POST groups for all interval variables whilst independent sample T-tests were used for continuous variables. One-tailed T-tests were used to compare snorkel behaviour between the PRE and POST groups.

Results

The results are preliminary results as the data collection is currently still on-going. Data collection is due to be completed by February 2012.

Behavioural Intentions and Prior Knowledge

The behavioural intentions of the participants in the PRE group (n=119) did not differ from those in the POST group (n=139, p=0.953). Attitude was measured on several different scales (direct and indirect measures) and all scales showed that the PRE and POST group (n=120, 140 respectively) did not

differ. PRE and POST participants did not differ significantly in the prior knowledge they had at the start of the snorkeling excursion (n=122, 138 respectively). The average scores were 62% (PRE) and 59% (POST) (scale of 1-100%; p=0.17).

Snorkel Behaviour

Average contacts with the reef substrate were in favour of the POST group being more pro-environmental, however, these were not all significant (PRE n=117 and POST n=120). Significant differences in favour of POST group were as follows: more contacting dead substrate unintentionally, more standing on dead substrate uncomfortably and more standing on dead substrate comfortably. When various behaviours were combined there were significant differences in favour of the POST group being more environmentally-minded. Intentional behaviours that were carried out in a comfortable manner and resulted in being positive for the environment (standing comfortably on dead substrate, standing comfortably on seagrass and intentionally touching dead substrate) were significantly more in the POST group as compared to the PRE group. Behaviours that were positive for the environment were also significantly more in the POST group (intentionally touching dead substrate, unintentionally touching dead substrate, standing uncomfortably on dead substrate, standing comfortably on dead substrate, standing comfortably on seagrass and standing uncomfortably on seagrass).

Visitor Experience :Information-based Results

Participants stated that important reasons for coming on a glass boat snorkeling excursion included learning more about nature and coral reefs. They continued to state that an important reason for visiting a marine park was to gain information on marine life. This is portrayed in fig 2. These are the participants of the PRE and POST group combined (there was no significant difference between the PRE and POST groups, n=113, 125).

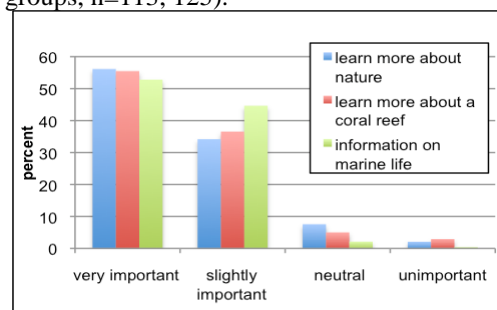


Figure 2: The importance of different reasons for attending a glass boat excursion (the blue and red bars) and visiting a marine park (green bar).

Participants in both the PRE and POST group were asked if they received a presentation on the day's excursion (n=116, 126). In the PRE group 36% answered yes whilst in the POST group 61% answered yes. This difference is significant (p=0.004). Participants were then asked how satisfied they were with each aspect of the presentation or guided activities (PRE n=107, POST n=118). Fig 3 shows that the POST group was more satisfied with the amount of interaction (trending, p=0.058), use of diagrams, pictures, illustration etc. (p=0.002) and how the information was worded or explained (p=0.003).

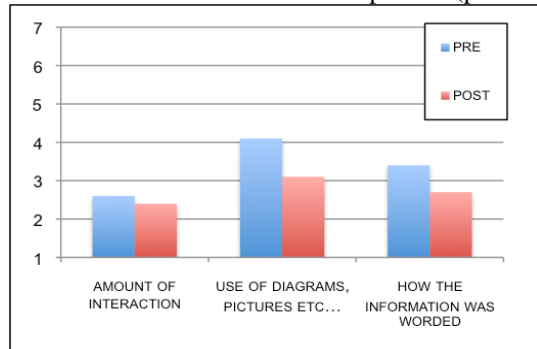


Figure 3: How satisfied participants were with aspects of the presentation or guided activities (1= very satisfied, 7= very unsatisfied).

Both the PRE and POST group admitted that there were factors that added to their enjoyment (no difference between the groups, p=0.98, n=116, 125). The top two reasons for the PRE and POST groups were enjoying marine life (56% for PRE and 49% for POST) and the influence of the crew (being friendly, helping, informative, etc.; 16% for PRE and 14% for POST). However, when the influence of the crew factor is examined more closely it shows that in the PRE group only 31% is a result of the crewmember being informative whereas in the POST group 55% of the factor is explained by the crewmember being informative. Furthermore, the enjoyment of the participants in the POST group was more positively influenced by information on marine life during their excursion (p=0.049, PRE n=113, POST n=123).

The elaboration or critical thinking of a particular issue was also measured by using five questions. Looking at each question individually the only significant difference between the PRE and POST group was that in the latter the presentation and/or guided activities made them more curious (p=0.01, n=103, 120). However, when the total elaboration score was examined it showed that a trend existed that more elaboration occurred in the POST group than the PRE group (p=0.054).

Discussion

One component of an interpretation program is providing an opportunity to put into action what

participants have been thinking about. Results have shown that participants in the PRE and POST have similar intentions and attitudes when it comes to not disturbing life on a coral reef. This is important as any differences in subsequent snorkel behaviour can thus be attributed to the effectiveness of the interpretation program (the only difference between the PRE and POST group). The preliminary results have shown that participants in the POST group have more pro-environmental behaviours suggesting the interpretation program has been effective.

Information is another component of an effective interpretation program and the preliminary results have supported this fact. The PRE and POST group participants had a similar level of prior knowledge at the start of the excursion and they both attached a value of importance to receiving information on marine life. This indicates that the PRE and POST groups were similar. However, more participants in the POST group admitted to having received a presentation and they were also more satisfied with certain aspects of that presentation (fig 3). The results have also shown that both the PRE and POST group participants admitted to various factors that enhanced their enjoyment. When the influence of the crew is examined it becomes evident that in the POST group the participants are happier with the knowledge/information levels of the crew. This is supported by the fact that participants in the POST group are more satisfied with "information on marine life." The afore mentioned facts support that information is flowing to the participants and the transfer tool that is facilitating this flow is the crew of the glass boat. This furthermore supports the efficacy of the interpretation program, as this was the only difference between the PRE and POST group.

The final supporting results that add to the efficacy of this interpretation program are the amount of elaboration that occurred in both the PRE and POST groups. Participants in the POST group were stimulated more to critically think about an issue or issues. This critical thinking could explain the increase in pro-environmental behaviours in that group. This would imply that the interpretation program was successful in creating critical thoughts in participants that influenced their behaviour accordingly.

In conclusion, the POST group exhibited more environmental behaviours, was more satisfied with information flowing through the guides, and were stimulated to critically think more about certain issues (elaboration) that the guides brought to their attention. The only difference between the PRE and POST groups was the interpretive program, and therefore these results can be attributed to the success of the interpretive program.

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