



GREAT BARRIER REEF
MARINE PARK AUTHORITY

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Visitor Experiences, Values and Images of Whitehaven Bay: An Assessment of Perceived Conditions

Jayne Ormsby and
Scott Shafer

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An Assessment of
Perceived Conditions**

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Marine Park Authority
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Jayne Ormsby and Scott Shafer

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CONTENTS

SUMMARY	1
ACKNOWLEDGMENTS	4
1.0 INTRODUCTION	5
1.1 Background to the Investigation	5
1.2 Significance to Management	6
1.3 Aims and Objectives.....	6
2.0 A REVIEW OF RELATED LITERATURE	9
2.1 Recreational Opportunity Spectrum and Limits of Acceptable Change.....	9
2.2 Conditions Influencing Users' Experiences	9
2.2.1 Other People and Human-made Structures	10
2.2.2 Noise	10
2.2.3 Aircraft Activity	11
2.2.4 Weather and Biophysical Conditions	11
3.0 RESEARCH METHODS	12
3.1 Data Collection Methods	12
3.2 The Study Site	12
3.3 Whitehaven Beach Tour Operators	13
3.4 The Survey Instrument	14
3.4.1 Survey Components	14
3.5 The Procedure	16
3.6 The Sample	16
3.7 On-site Observations	17
3.8 Interest Group Survey	17
3.9 Data Analysis	17
3.10 Limitations of the Investigation	18
4.0 RESULTS	19
4.1 A Description of Visitors to Whitehaven Beach	19
4.2 Previous Visitation to the Whitsunday Region and Whitehaven Beach	20
4.3 A Comparison of Tour Operators and Differences in Visitor Characteristics	22
4.4 Expectations of Whitehaven Beach	22
4.5 Participation in Activities at Whitehaven Beach	23
4.6 Images of Whitehaven Beach	24
4.7 Values Ascribed to Whitehaven Beach	25
4.7.1 Differences in Values Ascribed to Whitehaven Beach based on Visitor Characteristics	25
4.8 A Review of Visitors' Experiences at Whitehaven Beach	26
4.8.1 Visitation Experiences Provided by Whitehaven Beach	26
4.8.2 Classifying Visitor Types Based on Experiences Provided by Whitehaven Beach	27
4.8.3 A Comparison of Visitor Types and Values Ascribed to Whitehaven Beach	28
4.9 An Evaluation of Conditions Experienced at Whitehaven Bay	29
4.9.1 A Summary of On-site Observations Recorded at Whitehaven Beach	29
4.9.2 Aircraft Activity Levels and Sound Impacts	33
4.9.3 The Influence of Conditions on Experiences at Whitehaven Beach	34
4.9.4 Perceived Conditions (Aircraft, Vessels and Crowding) of Whitehaven Beach	34
4.10 Visitors' Satisfaction with their Whitehaven Beach Experience	37
4.10.1 Improvements to Whitehaven Beach	37

4.10.2 Ratings of Trip Satisfaction by Visitors to Whitehaven	38
4.10.3 Future Visitation to the Whitsundays Region	40
5.0 DISCUSSION	42
5.1 Visitors' Experiences of Whitehaven Beach	42
5.2 The Values Ascribed to Whitehaven Beach	43
5.3 Conditions Influencing Visitors Experiences	44
5.4 Images of Whitehaven Beach	46
5.5 Implications for Management	47
5.6 Future Research and Monitoring	48
6.0 CONCLUSION	50
REFERENCES	51
APPENDICES	57
FIGURES	
1. The Great Barrier Reef Marine Park, Australia	7
2. Whitehaven Beach and its location in the Whitsunday Island Group	12
3. Whitehaven Bay settings	13
4. Number of visitors surveyed on each tour operation	17
5. The age distribution of visitors to Whitehaven Beach	19
6. Visitors' place of origin	20
7. Settings visited by respondents	30
8. Weather conditions experienced at Whitehaven Bay by visitors	30
9. Sea conditions experienced in Whitehaven Bay by visitors	31
10. Sea conditions experienced in exposed water by visitors to Whitehaven Bay	31
11. Visitors experiencing seaplane overflights	32
12. Visitors experiencing seaplane events	32
13. Visitors experiencing overflights by helicopters	33
14. Visitors experiencing helicopter events	33
15. Rating of visit to Whitehaven Beach	38
16. Would you recommend Whitehaven Beach to others?	39
TABLES	
1. Number of survey trips and setting visited by each tour operator	14
2. Highest level of education achieved by respondents	19
3. The states from which visitors to Whitehaven Beach resided	20
4. The country of citizenship of visitors to Whitehaven Beach	20
5. The types of groups that visitors to Whitehaven Beach travelled with	21
6. Previous visitation to the Whitsundays region	21
7. Respondents' last visit to the Whitsundays region	21
8. Number of previous visits to Whitehaven Beach by respondents	21
9. Respondents' last visit to Whitehaven Beach	22
10. Type of tour operator and differences in visitor characteristics	23
11. Type of operation chosen by repeat visitors to Whitehaven Beach	23
12. Expected experiences from visitation to Whitehaven Beach	24
13. Activities participated in by visitors whilst at Whitehaven Beach	24
14. Post-visitation images of Whitehaven Beach	25
15. The importance of values associated with Whitehaven Beach	25
16. A comparison of spiritual values held for Whitehaven Beach by international and Australian visitors	26

17.	A comparison of values held towards Whitehaven Beach as a place of scientific research by international and Australian visitors	26
18.	Visitors' evaluation of experiences at Whitehaven Beach	26
19.	Four benefit domains received by visitors to Whitehaven Beach	27
20.	Types (clusters) of Whitehaven Beach visitors based on how much each of the four benefit domains were provided	28
21.	A comparison of values ascribed to Whitehaven Beach based on benefit cluster membership	29
22.	Average numbers observed in each setting of Whitehaven Bay	31
23.	Aircraft observations at Whitehaven Beach	32
24.	Things that added to visitors' enjoyment whilst on Whitehaven Beach	34
25.	Things that detracted from visitors' enjoyment whilst at Whitehaven Beach	35
26.	Visitors' perceptions of the number of aircraft, vessels and people at Whitehaven Beach	35
27.	Perceptions of the distance away from aircraft, vessels and other people on Whitehaven	35
28.	Ratings of noise from aircraft activity, vessels and other people	36
29.	Perceptions of aircraft noise between visitors who experienced no events and those who experienced one or more event	36
30.	Perceptions of aircraft noise between visitors who experienced no aircraft overflight versus those who experienced one or more overflight	36
31.	Conditions that had an influence upon visitors' enjoyment at Whitehaven Beach	37
32.	Suggested improvements to Whitehaven Beach by visitors	37
33.	A comparison of visitors rating of their trip to Whitehaven Beach based on benefit cluster membership	38
34.	Respondents' satisfaction with services provided by operators to Whitehaven Beach	39
35.	A comparison of trip satisfactions based on benefit cluster membership	40
36.	Future holiday destination in the Whitsundays region	41
37.	Type of trip visitors would like to take on a future holiday to the Whitsundays region	41

APPENDICES

1.	Visitor Survey 1	57
2.	Visitor Survey 2	61
3.	Captain's announcement	63
4.	Observation form	64
5.	Interest group information letter and survey	66
6.	A summary of results from the Interest Group Survey	71
7.	Expected experiences from Whitehaven Beach	73
8.	Post-visitation images of Whitehaven Beach	74
9.	Number of aircraft observations by setting over 15 visits	75
10.	A summary of Hamilton's (1999) aircraft review	76
11.	Things that added to visitors' enjoyment whilst at Whitehaven Beach	78
12.	Things that detracted from visitors' enjoyment whilst at Whitehaven Beach	79
13.	Conditions that had an influence upon visitors' enjoyment at Whitehaven Beach	80
14.	Suggested improvements to Whitehaven Beach	81
15.	Future holiday destinations in the Whitsundays region	82
16.	Type of trip visitors would like to take on a future holiday to the Whitsundays Region	83

SUMMARY

At present, recreation and tourism are major and growing uses of the Great Barrier Reef Marine Park. Visitors are attracted to the Great Barrier Reef from all over the world to experience the beautiful islands, beaches and coral reefs. The management of this region is the responsibility of the Great Barrier Reef Marine Park Authority, who are faced with the challenge of preventing unacceptable impacts of tourism while ensuring equitable resource allocations and sustained multiple use. The Authority's goals are achieved through the development of plans of management, the provision of zoning and allocation of individual permits.

The Whitsundays region, and more specifically Whitehaven Beach located on Whitsunday Island, is one of the most popular tourist destinations within the Marine Park. Regarded as one of the top 10 beaches in the world, Whitehaven Beach is accessed daily by a range of craft including large catamarans, charter boats, cruising yachts and aircraft. Concern has been expressed that increased visitation may be compromising some of the aesthetic, natural and social values associated with the Whitehaven Bay area.

The Great Barrier Reef Marine Park Authority in conjunction with Queensland Parks and Wildlife Service is currently reviewing aspects of the Whitsundays Plan of Management. As a component of these planning revisions specific attention is required for Whitehaven Bay. At present there is no information about how visitors perceive the natural and social environment of Whitehaven Bay. The aim of this investigation was to assess how visitors are using and experiencing the Whitehaven Bay area, whilst evaluating the influence of aircraft and vessel activity upon people's use and amenity.

To obtain this information data were collected in three ways: 1) visitor survey; 2) on-site observations; 3) local interest group survey. Self-administered questionnaires were completed by 583 day-trip visitors onboard tourist boats in March and April 1999. The visitor survey was designed to acquire data of a social nature by measuring visitors' expectations, values, experiences, images and perceptions of the Whitehaven Bay environment. In addition to the visitor surveys, on-site observations recorded details about weather conditions, the setting visited, amount of time spent on the beach by the operator, the number and type of vessels observed in each setting and the activities of aircraft. A small sample of 20 local interest group members completed a mail survey. The purpose of collecting this information was simply to provide a richer understanding of local perceptions of the present conditions and management of Whitehaven Beach.

Results from the investigation include the following key findings.

- A Description of Visitors to Whitehaven Beach

A total of 583 visitor surveys were completed (97% response rate). Of the sample 56% were female and 44% male, with 40% aged between 20–29 years. Fifty per cent were Australian visitors (4% local residents) and 50% were international travellers, mostly from Britain (41%), Europe (21%) and North America (21%). Twenty-two per cent had previously visited the Whitsunday region, and 10% had visited Whitehaven Beach on a prior occasion.

- Values and Images of Whitehaven Beach

Visitors and members of local interest groups felt that Whitehaven Beach was mostly valuable for its natural and ecological processes, conservation, recreation and educational opportunities. The values associated with economic opportunities and spiritual meaning were of least importance to respondents. Used as a management tool these significant values will help to legitimise the meanings that users and visitors assign to Whitehaven Bay.

The images that visitors took away with them from their trip to Whitehaven Beach are a reflection of their core experiences and perceptions of this destination. The three most popular terms that visitors used to describe Whitehaven Beach were beautiful, relaxing and calming, quiet and tranquil. The clean beach, pure white sand, crystal clear water and unspoilt natural environment were also images of Whitehaven Beach reflected in many visitors' responses.

- Visitors' Experiences of Whitehaven Beach

Visitors' three most sought-after experiences related to participating in water-based activities such as swimming and snorkelling, enjoying the beach and water, and relaxing and bathing in the sun. The expectations visitors had of Whitehaven Beach were satisfied, with most participating in passive activities such as swimming, relaxing and sunbathing, taking photos and beach walks.

The natural and scenic qualities of Whitehaven Beach were attributes that visitors received most enjoyment from. Benefits relating to rest, relaxation and escape from routine were rated next as experiences well provided by visiting Whitehaven Beach. Whitehaven Beach was not evaluated highly as a physically or socially active place.

- Visitor Types

Visitors were classified into four groups (clusters), identified to reflect types of people benefiting from similar recreational experiences. *Passivists* received few benefits from their trip, ascribed less value to Whitehaven Beach and received less satisfaction from their visit. *Socially active naturalists* were quite the opposite, receiving a great deal from each benefit domain. This group were more likely to feel that Whitehaven Beach was very valuable and obtained a lot of satisfaction from their visit. *Relaxed sightseers* received most enjoyment from escaping routine, relaxing and viewing the natural beauty of Whitehaven Beach. *Nature escapists* received benefits relating to experiencing nature and escaping routine. This group was most likely to place a high value on the natural and ecological processes of Whitehaven Beach. These different visitor profiles reflect that there is a spectrum of benefits resulting from experiences on Whitehaven Beach.

- On-site Observations

Weather conditions were highly unfavourable during data collection. Only 12% of the sample experienced clear (fine) weather. Most surveying was undertaken on overcast/rainy days with rough sea conditions and strong winds, making travel uncomfortable for many passengers.

Setting 2 (High Use, southern end) was the most frequently visited site along Whitehaven Beach. A daily average of 137 people, two large vessels, three medium boats, two small boats and four yachts were observed in Setting 2 during the surveying period. Observed aircraft overflights ranged from 0 to 4 by seaplanes (\bar{X} 1.3) and 0 to 3 for helicopters (\bar{X} 1.0). An average of one helicopter event and one seaplane event were recorded per trip during data collection.

- Perceived Conditions at Whitehaven Beach

The presence of other people and their activities did not affect visitors social amenity whilst at Whitehaven Beach. Twelve per cent reported that they felt there were too many people on the beach, whilst 85% indicated that the number of other people didn't concern them.

There was no significant influence upon visitors' use and amenity from the activities of aircraft or vessels at Whitehaven Beach. Approximately 90% of the sample indicated that noise, distance and numbers of these craft did not affect their enjoyment of Whitehaven Beach.

- Trip Satisfaction

Eighty-nine per cent rated their Whitehaven Beach visit as highly satisfying, with 69% indicating that they would definitely like to return in the future. Most of visitors indicated that they would like Whitehaven Beach to remain in its present state—natural and undeveloped.

This investigation has highlighted a number of experiential preferences and conditions that may be useful as indicators from which to monitor changes in social amenity at Whitehaven Beach. This baseline information can assist planners in developing an experience-based approach to designating use (types and amounts) and selecting indicators in a Limits of Acceptable Change (LAC) process. It is hoped that results from this preliminary investigation will provide information from which effective management and planning decisions can be made to both protect and provide for the existing diversity of opportunities at Whitehaven Beach.

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1.0 INTRODUCTION

The Great Barrier Reef extends 2000 km along the north-eastern coast of Queensland, from Cape York at the northern tip to just north of Frazer Island in the south. Covering an area of 347 800 km², the Great Barrier Reef World Heritage Area constitutes the world's largest continuous complex of coral reefs (Wachenfeld et al. 1998). Its outstanding natural features and ecological integrity secured the Great Barrier Reef's inscription on the World Heritage list in 1981 (Fenton et al. 1998). Proclaimed and zoned as a Marine Park in 1975, the Great Barrier Reef is presently the largest marine park in the world (see figure 1). The Great Barrier Reef Marine Park Authority (GBRMPA) is the principle advisor to the Commonwealth Government on the care and development of the Great Barrier Reef Marine Park (GBRMP). As managers, the Marine Park Authority's goal is to provide for the protection, wise use, understanding and enjoyment of the Great Barrier Reef (Craik 1992). A feature of Marine Park management is its multiple-use philosophy which seeks to ensure equitable access to all users whilst protecting the region's natural and cultural values.

Today the GBRMP supports a variety of uses and activities ranging from shipping, commercial fishing, traditional hunting, recreation and tourism (Kenchington 1990; Craik 1992). Economically, tourism is the largest industry in the Great Barrier Reef World Heritage Area, earning over \$650 million per annum (Driml 1999). Tourism also attracts the greatest number of users to reef and island areas. For the period from July 1994 to June 1995, it was estimated that 2.2 million people had visited the GBRMP (Valentine et al. 1997). Growth in commercial tourism use is expected to continue well into the next millennium (Driml 1994; Williams 1996).

As a reaction to the increase of human use in Marine Park environments, concerns have been raised about the ability of some reef and island areas to sustain desired levels of social and biophysical quality. Recently managers, residents and tourists have begun to call for limits on certain types of activities within the GBRMP (Carey 1993; McPhail 1995; Alder 1996). Documented evidence of the past 100 years has reflected the impacts of anthropogenic activities on reef environments (Rasmussen et al. 1992), however existing information about the effects of human use on social values and amenity in GBRMP areas is scarce. Managers recognise that natural and social systems relating to the Great Barrier Reef environment are interdependent. Research agencies such as GBRMPA and the Cooperative Research Centre for the Great Barrier Reef World Heritage Area are now placing a greater emphasis on the social-psychological issues associated with use and experience of reef and island environments in order to better manage visitor use, experience and potential environmental impacts (Fenton et al. 1998).

Tourism and other usage of the GBRMP is primarily managed by GBRMPA and the Queensland Parks and Wildlife Service (QPWS) (Scherl et al. 1997). The overall management of the GBRMP is accomplished through the development of plans of management, the establishment of zoning provisions, education and information programs and individual permit operations (Wachenfeld et al. 1998). Zoning plans set out the objectives for each zone, the uses that are suitable (some requiring a permit) and those activities that are prohibited. Any current or proposed use of the Park is assessed by GBRMPA in terms of the impacts on the proposed and existing future amenity of users of the area and adjacent areas (Wachenfeld et al. 1998). Marine Park planners strive to implement strategies that provide for a range of uses and experiences in ways that are ecologically sustainable.

1.1 Background to the Investigation

Tourism and recreation are major uses of the Whitsundays region with over half a million people visiting this area of the GBRMP each year. Visitors are attracted to the region by the spectacular scenery of the many islands, fringing reefs and beautiful beaches. Whitehaven Beach, regarded as one of the top 10 beaches in the world, is one of the most popular tourist destinations in the Whitsunday Group. Accessed by a range of craft including 'big cats', cruising yachts and aircraft, more than 80 000 visitors were taken to Whitehaven Beach during the 94/95 financial year (based on EMC data from commercial operators) (Wachenfeld et al.

1998). It is likely that Whitehaven Beach will continue to follow the current trends of increased visitation. Under such circumstances it is felt that some of the aesthetic, natural and social values associated with Whitehaven Beach may be compromised by increased human use.

Day-to-day management of the Whitsundays region is conducted through joint arrangements between GBRMPA and QPWS. The Whitsundays Plan of Management has been developed to protect and conserve the values of the Whitsundays area while allowing for a range of use opportunities. At present the Marine Park Authority is committed (MPA 160/5) to review this Plan of Management, and as a component of these planning revisions specific attention is required for the Whitehaven Bay area.

(Note: For the purpose of this investigation Whitehaven Bay includes the areas of Whitehaven Beach, Hill Inlet and Tongue Point.)

At present there is no information about how visitors perceive the natural and social environment of Whitehaven Beach. Of specific interest to GBRMPA planners are how people are using and experiencing the Whitehaven Bay area, and what the values are that users ascribe to this particular location. Additionally this assessment was required to examine the influence of aircraft and vessel activity upon visitors' use, experiences and amenity. The amenity issue associated with seeing and hearing aircraft, particularly by non-aircraft visitors, is one that has been of particular concern due to increasing use. Information on aircraft will be used by the Authority to develop site plans for the area of Whitehaven Bay and assess and amend (where necessary) the Whitsundays Plan of Management.

1.2 Significance to Management

The Whitsundays is a region where increased visitation requires careful consideration by management. For popular Whitsunday sites such as Whitehaven Bay, it is imperative that managers have a clear understanding of the values, perceptions and experiences of those that use and come to visit the area. In this context, it is useful for innovative planning to be able to forecast the factors that are likely to influence people's experiences and perceptions of Whitehaven Beach. For management, an understanding of environmental imagery and the meaning of place opens many new avenues in planning for a balance between tourism use/development and the marine environment.

The administration of strategic planning exercises and collection of information to identify and monitor conditions on visitors' use and amenity is important to Marine Park management for a number of reasons:

- to ensure that tourist expectations and experiences are met by providing, where possible, relevant opportunities;
- to address the effects of various uses and activities before acceptable levels of impact are exceeded;
- to assist with the revision of zoning permits and licenses in order to clarify appropriate levels and distribution of use;
- to provide and improve baseline information from which management and planning decisions can be made and monitored, e.g. effectively consider and assess permit applications; and
- to help understand and predict how people will react to increased use of the area.

1.3 Aims and Objectives

The aim of this investigation was to assess visitors' use, experiences and perceptions of Whitehaven Bay (including Whitehaven Beach and Tongue Point), whilst evaluating the influence of aircraft and vessel activity upon people's use and amenity. Information will be used as a reference by GBRMPA and QPWS to develop site plans and amend, where necessary, aspects of the current Whitsundays Plan of Management related to Whitehaven Bay.

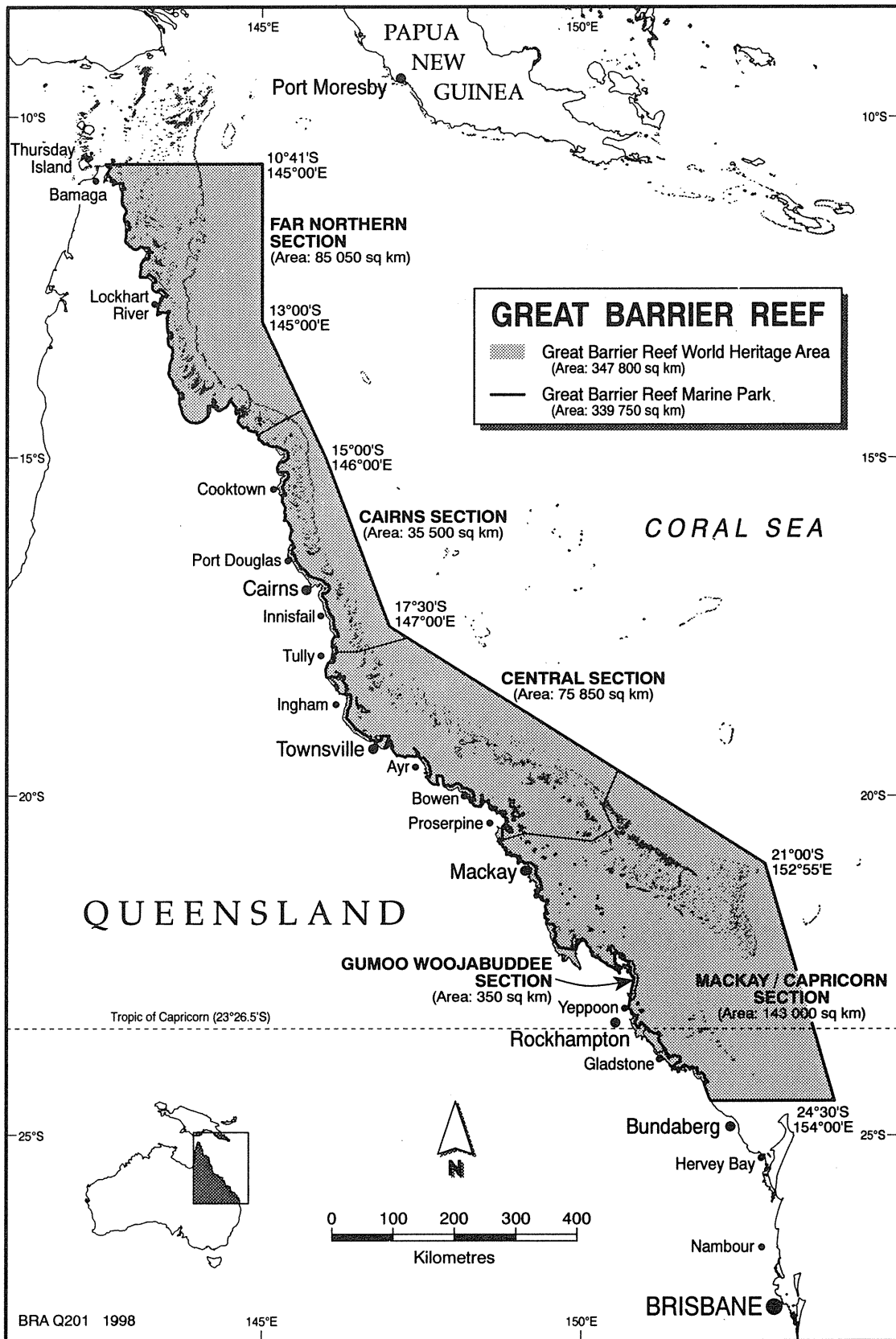


Figure 1. The Great Barrier Reef Marine Park, Australia. Source: GBRMPA 1998

In an effort to gain information for Marine Park Planners, the objectives of this study were to:

- obtain a profile (socio-demographic and experiential) of visitor types to Whitehaven Beach;
- describe the extent of use and nature of activities undertaken at various settings along Whitehaven Beach by visitors;
- identify the values ascribed to Whitehaven Bay by visitors;
- gain an insight into the types and range of experiences had by visitors to Whitehaven and the conditions that influenced such benefits;
- assess perceptions of aircraft use in the Whitehaven Bay area and the associated effects on visitors' use and amenity; and
- evaluate whether the presence of vessels and their size had an impact upon visitors' perceptions and experiences whilst at Whitehaven Beach.

2.0 A REVIEW OF RELATED LITERATURE

2.1 Recreational Opportunity Spectrum and Limits of Acceptable Change (Experience-based Approaches to Management)

A major goal of outdoor recreation planning and management is to provide opportunities for people to realise desired recreational experiences whilst maintaining the resource base from which the opportunities are provided (Paradice 1985). A framework developed by the US Forest Service in the early 1970s to accomplish this goal is the Recreational Opportunity Spectrum (ROS) (Clark & Stankey 1979). Over the years, the ROS has been used to manage and understand the diversity of experiences and activities sought by users in many different environmental areas. The ROS provides for a spectrum of experiences ranging from those that apply to high intensity developed areas at one end of the scale, to the provision of solitude and freedom in preserved natural environments at the other. Within this spectrum of setting classifications it is generally assumed that different social and biophysical conditions may be more or less important and or acceptable to users (Shafer et al. 1998).

Utilisation of an experience based management approach such as the ROS to regional tourism planning in the GBRMP was identified in the early 1980s (Shafer et al. 1998). Throughout the years there has continued to be discussion regarding the need to provide environmental settings that satisfy a spectrum of reef experiences and activity opportunities (Kenchington 1990; Scherl et al. 1997). To date there has been little research to further understand the potential for systematic management of recreational and tourist activities based on this approach in the GBRMP (Shafer et al. 1998).

In the context of the ROS, it is important to understand what experiences people are receiving in a setting. Previous studies have found that different visitors desire and expect different attributes from a recreational setting (e.g. Driver & Cooksey 1980; Manfredo et al. 1980; McLaughlin & Paradice 1980). Measuring what people receive from a trip to a natural place can be accomplished in terms of the benefits received (Driver & Brown 1978; Driver et al. 1987a). For example, being in a natural environment, having some excitement and being close to friends and family may be regarded as some of the benefits that people might receive from different types of settings (Driver et al. 1987). For managers, the goal is to implement planning strategies to accommodate the needs of the present and potential visitors whilst taking into consideration the ability of the resource to provide such opportunities (Paradice 1985). Shafer (1969) suggests that the aim is not simply just to manage for the average experience but to provide opportunities and benefits that cater for everyone.

Identifying standards of acceptable conditions in relation to received benefits ties into a concept developed over the past two decades referred to as the Limits of Acceptable Change (LAC). As a supplement to carrying capacity, the LAC is based on the premise that unchecked recreational use of an area can build to a point that diminishes the quality of both the natural environment and the recreational experience. Managers using the LAC approach should develop and describe the recreational opportunities that will be provided, identify the ecological and social factors that are likely to change and then select indicators which can be used as a gauge to determine the appropriate amount of change (Stokes 1991). Extensive lists of items used as indicators of the condition of natural and social resources have been developed from years of research in terrestrial environments (e.g. Whittaker 1992; Watson & Cole 1993 in Shafer et al. 1998). Only recently have studies been undertaken to determine such indicators as they exist in the GBRMP environment (Shafer et al. 1998).

2.2 Conditions Influencing Users' Experiences

In marine environments and tourist settings, social and environmental conditions need to be better understood in the carrying capacity and the LAC framework. For managers the challenge is to measure how visitors feel about an experience and place so that parts of the experience or conditions relating to an environment can be selected and monitored for acceptable change over

time (Shafer et al. 1998). Previous research in land-based environments has suggested that overcrowding, noise, weather conditions, environmental degradation and an inappropriate mix of facilities are all conditions that may detract from users' experiences in certain environments (e.g. Anderson et al. 1983; Daniel & Boster 1976; Dellora et al. 1984). In marine environments (reef and island areas), conditions experienced may be similar to those found in terrestrial environments. These conditions and their effects upon people's experiences are discussed briefly below.

2.2.1 Other People and Human-made Structures

Social carrying capacity has been described as a level of use beyond which other users negatively affect a person's experience in an environment (Paradice 1985). Several studies have revealed that the presence of other people and clearly visible human-made structures can cause significant concern amongst some wilderness users. Large numbers of people in a natural setting have been judged as intrusive and found to degrade users' perceptions of the natural beauty of an environment (Ulrich 1993; Daniel 1990; Zube 1974). Previous research has also indicated that visitors are more likely influenced by evidence of inappropriate human behavior such as littering, noise or environmental destruction (Roggenbuck et al. 1993; Shafer & Hammit 1995). Earlier research has shown that the variety in activities pursued, settings, previous visitation and personal expectations of different users makes a single desirable level of use very difficult to determine (Graefe et al. 1984; Stankey & McCool 1984). Factors such as the numbers and types of structures (e.g. boats, aircraft, motor vehicles), the distance between them, and the number of people they support are all examples of 'social conditions' which may have an impact upon users' experiences (Stankey 1973; Roggenbuck et al. 1993; Manning et al. 1996). The influence of crowding and human-made structures on visitors' experiences at reef and island environments has been recognised as an issue requiring specific research attention in the GBRMP.

2.2.2 Noise

The rapid spread of human-produced noise throughout national parks and wilderness areas in the United States has been recognised as a serious problem in terms of its impact upon recreational users and their activities (Dellora et al. 1984; Mace et al. 1999). Noise is defined as an unwanted sound. As such, when sounds encountered are loud, unpredictable, uncontrollable and considered inappropriate for a given area, the 'noise' will most likely be considered annoying and detract from other preferred experiences such as the enjoyment of nature (Mace et al. 1999). Driver et al. (1987b) suggest that the primary reasons people visit a national park, forest or outdoor recreational environment is to escape the noise and stresses of urban lifestyle. It is of no surprise that noise pollution in natural environments has been classified as an environmental stressor.

Research has shown that noise in natural environments can have a significantly negative impact on recreational experiences by interrupting people's feelings of solitude and tranquillity (Kariel 1990; Kaplan 1995; Kaplan & Talbot 1983). A study undertaken in Australia by Dellora et al. (1984) on fourwheel drive users, bushwalkers, picnickers and other recreationists, found that noise (from motorbikes) was the main cause of recreational conflict. Technological noise related to motorised vehicles, chainsaws and aircraft has also been rated as annoying and disruptive to visitors surveyed in national parks in Canada (Kariel 1990). Kariel (1990) suggested that human induced and technological sounds 'should be kept generally low in outdoor recreation-type environments in order to safeguard a recreational milieu' (p. 148).

There have been very few studies that have dealt with the issue of noise on social amenity in Australian national parks or other environmental areas. In the GBRMP it is likely that some sites are prone to experiencing regular noise from crowds of visitors, commercial vessels, dinghies, jet skis, helicopters and airplanes. Little research to date has investigated how noise, and different sources of noise, influence people's experiences and images of a setting in Marine Park areas.

2.2.3 Aircraft Activity

Aircraft activity generates noise. In America the issue of aircraft overflights in national parks and wilderness areas has been a focus of attention for many years. In 1987 the National Parks Overflight Act (Public Law 100-91) was passed which required the National Park Service and the Forest Service to identify 'acceptable levels' of aircraft overflights in federal wilderness areas (Mace et al. 1999). This requirement led to an increase in research investigations that examined the many facets involved with aircraft overflights in wilderness areas. Areas examined varied greatly with regards to the frequencies of overflights, visitation rates, aircraft types, decibel levels, and range of aircraft sound exposures. Sensitivity to aircraft sound was shown to be site and setting specific. The Grand Canyon has become an area of significant interest in aircraft research on visitor experience. In a study by Tabachnick et al. (1992) the Grand Canyon was ranked the highest in terms of noise exposure and frequency of aircraft flights; with 36 independent operations providing sightseeing and helicopter rides. Findings from aircraft research at the Grand Canyon has resulted in a number of new regulations to minimise the effects of aircraft overflights to recreational users in the United States.

Negative attitudes have been expressed towards seeing and hearing airflights in wilderness areas (Tarrant et al. 1995). Tarrant and colleagues (1995) suggested that even low levels of aircraft noise could be evaluated negatively. Investigations have shown that aircraft noise represents undesirable sounds of urbanisation, and has strong effects on the quality of visitors' experiences (e.g. solitude and tranquillity) and interferes with the perceived aesthetic quality of landscapes (Mace et al. 1999). A review of previous airflight research has reflected that noise has a psychological effect upon people's motivation and performance (Smith 1989; Smith & Stansfield 1986), as well as their physiological behavior (Berglund et al. 1990). However, the primary impact of aircraft activity upon users of natural environments is not necessarily noise related. There may also be a number of non-acoustical factors that relate to sight. Visibility of aircraft flying over or of condensation trails from aircraft may impact upon the users of natural environments (Berglund et al. 1990; Shultz 1978).

2.2.4 Weather and Biophysical Conditions

Physical conditions related to weather have never been regarded as a significant factor in the studies of recreation or tourism experiences. In marine environments, weather conditions may have a significant influence on user activities and experiences. Sea conditions in marine recreation are important as the sea serves as the travel medium and prevailing winds can significantly determine whether sea conditions are smooth or rough. For people who have had little experience with ocean travel, rough seas can result in an uncomfortable boat trip and motion sickness. In sites where swimming and snorkelling are popular activities, water visibility, air and water temperatures have direct associations with people's experiences of the visit (Shafer et al. 1998). As such, weather conditions, wind strength, temperature and sea conditions may well be factors that strongly influence visitor satisfaction and images of an island or reef destination.

Biophysical conditions associated with an area also may have an affect upon people's experiences and their perceptions of a location. For example, studies have shown that certain features of an environment such as its vegetation, geology and wildlife can be major indicators of natural conditions that influence users' experiences and evaluations of a site (Hammit & McDonald 1982; Shafer & Hammit 1995). In marine environments, the sizes, colours and quantities of corals and fish may influence people in much the same way that colour, size and quantity of terrestrial wildlife influence people (Shafer et al. 1998). The selection of good condition indicators such as those discussed above, congruent with experience dimensions, will assist managers with their attempts to provide quality environments for users.

Through this report we have attempted to measure some of the relative influences of various conditions upon people's experiences whilst visiting Whitehaven Beach.

3.0 RESEARCH METHODS

3.1 Data Collection Methods

After initial discussions with planners from GBRMPA and QPWS (Whitsundays division) three methods of collecting information were decided upon. The key methods used to gather data included:

1. Visitor Survey—a self-administered survey given to Whitehaven Beach visitors;
2. On-site Observations—a record of visitor numbers, aircraft activity and vessel types and numbers per setting;
3. Interest Group Survey—postal surveys sent to members of local interest groups.

For the purpose of this report, findings from the visitor survey in association with on-site observational records are presented. Results from the interest group survey will not be shown. However, general findings will be referred to throughout the discussion.

3.2 The Study Site

Whitehaven Beach is situated on the eastern side of Whitsunday Island approximately nine nautical miles east of Shute Harbour. Figure 2 shows the location of Whitehaven Beach on Whitsunday Island. Whitehaven Beach is a six-kilometre stretch of pure white silica sand that extends from Hill Inlet in the north to Solway Passage in the south-east (Wachenfeld et al. 1998). It is an all-tide beach that is very popular with day cruises and yachts. Behind the beach lies an acacia forest established on silica sand (Colfelt 1995).

Hill Inlet, which lies between Tongue Point and the northern point of Whitehaven Beach, is a visual icon for the Whitsundays region. This unique silica sand inlet and delta has many scenic and cultural values, and is an important conservation area (e.g. mangroves, seabird nesting) (Wachenfeld et al. 1998).

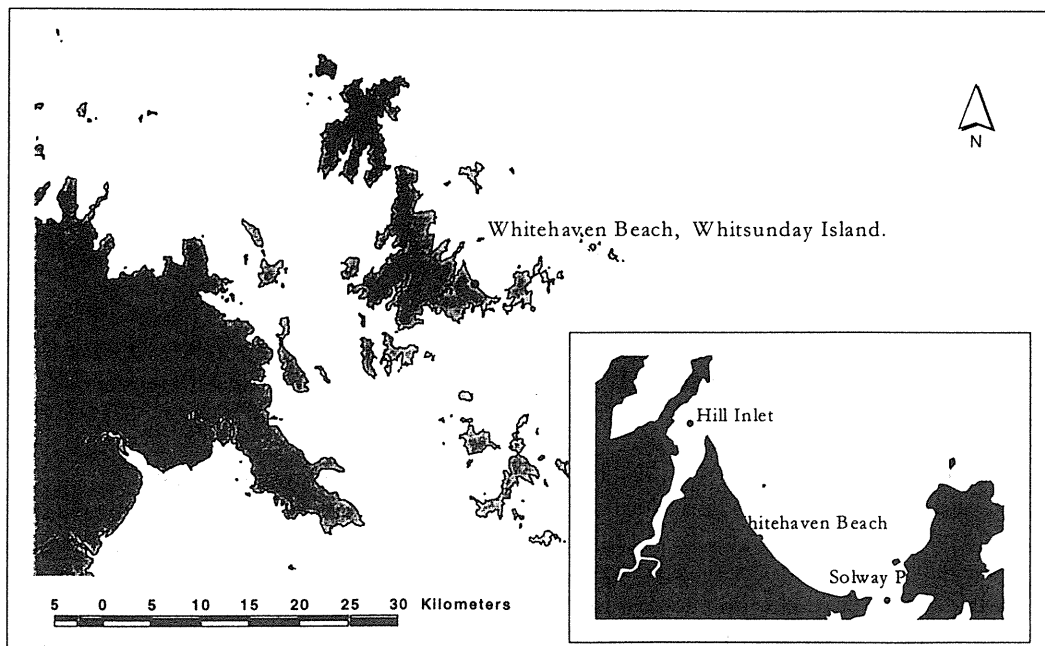


Figure 2. Whitehaven Bay and its location on Whitsunday Island. Source: GBRMPA 1999

The Whitsundays area has been divided into five recreational opportunity settings (figure 3). In order to manage for the increased use and visitation in the Whitsundays area the Authority has set limits on the vessel size, passenger load, types of craft facilities and activities allowed within these settings. This method of recreation planning is designed to provide different opportunities

these settings. This method of recreation planning is designed to provide different opportunities through the use of a spectrum of recreation settings (Clark & Stankey 1979). These areas of the Whitsundays have been assigned settings based on their values, existing use and management requirements (Wachenfeld et al. 1998).

The Whitehaven Bay area is one location that is currently divided into settings based on the ROS. Four settings along Whitehaven Beach have been identified in the Whitsundays Plan of Management. The site for High Use (Setting 2) which is located at the southern end of the beach is managed to cater for large numbers of visitors in a natural setting without adversely affecting conservation values (vessels < 35 metres and an unlimited number of people). Setting 3 is a Moderate Use area (vessels < 35 metres and up to 40 people). The regular aircraft landing area of Whitehaven Beach is assigned to Setting 3, half way along the beach, approximately two kilometres from each end. Tongue Point is also defined as a Moderate Use area. Setting 4 is designated as a Natural area (vessels < 35 metres and a group size limit of 15 people) and Setting 5 is a Protected area and includes Hill Inlet.

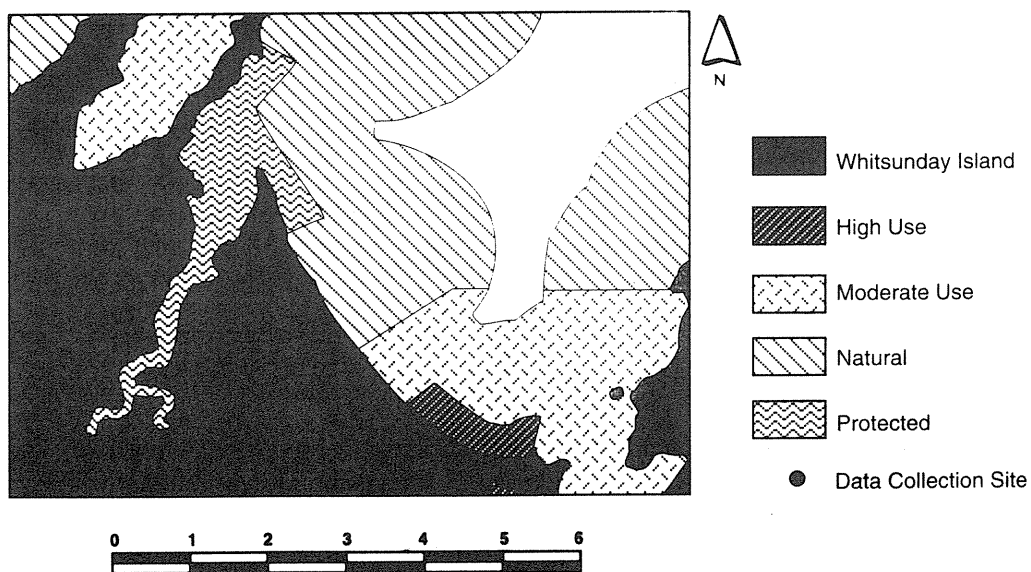


Figure 3. Whitehaven Bay settings. Source: GBRMPA 1999

3.3 Whitehaven Beach Tour Operators

Whitehaven Beach is visited daily by a number of different tour operators. Gaining cooperation from local tour operators was essential for the successful collection of visitor information for this study. A number of selection criteria were used to choose tourism operations for this research. The criteria involved:

1. the methods of transport (aircraft, sailing vessel, motorboat etc.);
2. the size of the operator (the number of tourists they carried and the intensity of use they represented); and
3. the setting visited (e.g. High Use, Moderate Use, Natural or Protected).

Five tour operators were approached and permission sought to undertake surveys with their passengers. All operators agreed to assist with the investigation. Operator 1 represented a large high-intensity use operation capable of carrying up to 400 passengers daily to Whitehaven Beach. Due to vessel size restrictions this tour operator only visits the southern end of Whitehaven Beach (High Use—Setting 2). Operator 2 was a large (21 m) sailing catamaran licensed to carry as many as 60 people onboard. This sailing craft travels three times a week to Whitehaven Beach Setting 2, but occasionally visits Tongue Point if weather conditions are favourable. Operator 3 is a maxi-yacht, which offers three-day cruises around the Whitsunday islands for up to 20 passengers. Operator 4 is a 12.5 metre boat which carries a maximum of 27 passengers and travels at speeds of over 65 km/hr. Operator 5 represented a smaller motor

vessel with seating for up to 17 guests. Operators 4 and 5 travel to either Setting 2 or Tongue Point, and their trip to Whitehaven Beach is just one of three destinations visited during the day. Operator 6, an aviation company, takes scenic flights to Whitehaven Beach landing in Setting 3. Visitation by this seaplane company is greatly dependent upon tourist demand and weather conditions. All operators offer similar activities for their guests and stay for between one to three hours on the beach.

Table 1 indicates the number of trips taken on each of the tourist boats and the setting visited during the data collection period. A total of 16 survey trips were undertaken on five different tourist boats from mid-March through to mid-April, 1999. The southern end of Whitehaven Beach (Setting 2) was the most visited site by four operators, and three trips were taken to Tongue Point (Moderate Use). No tourist vessels visited Settings 3 or 4 at Whitehaven Beach during the study.

Table 1. Number of survey trips and setting visited by each tour operator

Tour operator	Setting visited			Total trips
	Setting 2	Setting 3	Setting 3 (Tongue Point)	
Operator 1	8	0	0	8
Operator 2	1	0	3	4
Operator 3	1	0	0	1
Operator 4	2	0	0	2
Operator 5	1	0	0	1
Total	13	0	3	16

3.4 The Survey Instrument

After much consideration it was decided that a self-administered questionnaire was the best method of obtaining information from Whitehaven Beach visitors. It was felt that visitors would not want to complete extensive on-site interviews, especially since their time on Whitehaven Beach was limited. The development of a standardised, concise survey instrument meant that it was possible to achieve high response rates and therefore obtain a reasonable sample size whilst overcoming logistical constraints imposed by time and money. The survey (Survey 1, see appendix 1) took respondents approximately 10 minutes to complete.

A pilot study was undertaken to refine the survey instrument and identify initial problems. During the pre-testing phase one problem was exposed which concerned the length of the survey. It was found that passengers on smaller boats had difficulties completing the survey due to limited time and rough sea conditions. Water spraying over the boat made completing a survey onboard impossible. To compensate for this problem, a shorter survey (Survey 2) was administered on some of the smaller tourist boats. This survey took around five minutes to complete (see appendix 2). Both surveys were made available in English and Japanese.

3.4.1 Survey Components

Survey 1 was arranged into six sections each designed to capture and measure different experiences, perceptions and characteristics of visitors to Whitehaven Beach. Survey sections and questions are described below.

Introduction

The survey commenced with an introduction to the study and a statement ensuring that all responses would remain confidential.

Section 1: Visiting the Whitsundays region (Previous Visits)

Questions 1 and 2 were designed to gather information about respondents' previous visitation to the Whitsundays region and Whitehaven Beach.

Question 2c asked visitors whether they had, on previous visits, travelled with a different operator and if so why?

Section 2: Today's Visit to Whitehaven Beach

Questions 3 and 4 enabled visitors to respond to open-ended questions regarding things that 'added to' or 'detracted from' their Whitehaven Beach experiences. It was hoped that respondents would identify any intrusions or conditions that had an influence during their Whitehaven Beach visit without being let to do so.

Question 5 asked for information about the types of experiences people expected to have whilst visiting Whitehaven Beach. This question was included to evoke expectations and to provide an insight into people's motivations for choosing Whitehaven Beach as a destination.

Question 6 allowed the respondent to describe the Whitehaven Beach setting they visited by using three words or phrases, thereby reflecting visitors images of the beach.

Section 3: Values of Whitehaven Beach

The value scale (Question 7) presents a list of nine reasons why people might value Whitehaven Beach. This scale was constructed on wording in the legislation surrounding the formation of the GBRMP and designated park/protected areas in general (Shafer et al. 1998). Visitors were asked to rate, using a five-point scale ranging from 'no value' to 'extreme value', how important each item was to the value of Whitehaven Beach.

Section 4: Experiencing Whitehaven Beach

Question 8 included an experience scale that consisted of 16 items derived from research by Driver (1977) and adapted by Shafer et al. (1998). All items were intended to measure how well specific aspects of 'experience' and 'experience dimensions' were met during a person's visit to Whitehaven Beach. Research has indicated that these types of benefits represent important aspects of people's experience in the natural environment (Brown & Haas 1980; Manfredi et al. 1983). Respondents were questioned about how much their visit to Whitehaven Beach provided these benefits by allocating a score from 1) 'not at all' to 5) 'very high'.

Question 9 was an open-ended question aimed to elicit unprompted 'top of the head' responses with regards to what improvements could be made to Whitehaven Beach. This question was incorporated in the survey to identify any positive or negative issues that may have related to the current management of the area.

Question 10 presents a list of activities which visitors may have participated in whilst on Whitehaven Beach. Respondents were asked to indicate the activities they participated in during their visit on Whitehaven Beach and allocate the percentage of time they spent on each.

Question 11 asked visitors to rate how they felt about the 'number of visits', 'distance away from' or 'amount of noise by' vessels, aircraft activity and people. Respondents assessed how they perceived each of these conditions by circling one number on a four-point response format. Respondents were given the option of answering 'didn't matter to me', to avoid the problem of being forced to rate a condition they may have had no concern about.

Question 12 followed by asking respondents about whether aircraft activity, size of vessels or other people influenced their enjoyment, in either a positive or negative way, and if so how?

Section 5: Rating Your Whitehaven Beach Visit

Questions 13 and 14 gave respondents the opportunity to rate their visit to Whitehaven Beach on a scale from 1 to 10, and indicate whether they would recommend the trip to friends and family. Question 15 enabled respondents to rate how satisfied they were with the tour operator they travelled with and the services that were provided by staff.

Question 16 sought information about the likelihood of a return visit to the Whitsundays region, and the type of trip that the respondent would take.

Section 6: General Characteristics

Section six sought details on the socio-demographic and group characteristics of visitors.

Note: Questions 2c, 6, 7 and 15 were not included in Survey 2.

3.5 The Procedure

A sample of day use visitors (domestic and international) were surveyed onboard tourist boats on the return journey from Whitehaven Beach. Interviewing passengers onboard vessels had the advantages of gaining a post-visitation experience, not interrupting visitors whilst on Whitehaven Beach, and obtaining a captive audience during the administration of surveys. Sampling occurred on different days of the week to ensure that variation in visitor numbers was accounted for. As such, surveying was undertaken on selected weekdays, on weekends when visitation was busier and during each of the four public holidays over the Easter period.

The administration of surveys was undertaken jointly by the consultant and a team of volunteer research assistants associated with the Whitsundays Queensland Parks and Wildlife Service. A training session was held to familiarise research assistants with the survey and data collection procedures. This session was aimed to ensure that differences among researchers and recorded observations were minimalised. In addition, debriefing sessions were conducted after every data-collection trip to provide an opportunity for discussions about the trip and reflect upon observations made whilst at Whitehaven Beach.

To ensure the representativeness of the sample on each trip, different sampling techniques were employed on various tourist boats. On Operator 1, passengers were seated on upper and lower decks (some inside and others outside). Passengers on their return ferry were selected to represent an even spatial distribution within a given seating area. As such, passengers were randomly selected at tables and seating sections on both decks. The number of visitors approached depended upon the number of passengers travelling onboard that given day. On Operator 1 the captain made an announcement introducing the study and the research team. See appendix 3 for a copy of the Captain's announcement.

On smaller vessels it was possible for a single member of the research team to introduce the study and administer the surveys. A census was possible on these smaller vessels as passenger numbers ranged from six to a maximum of 32 during the surveying period. Operator 6 (Seaplane Company) distributed the survey during their debriefing at Hamilton Island.

3.6 The Sample

Of 610 surveys completed by visitors to Whitehaven Beach, 583 were used in the final analysis. Twenty-seven surveys (4.5%) were not used in the analysis because 11 of these were incomplete and 16 surveys from Operator 3 got wet onboard and therefore were unable to be read. Most people who were approached accepted the offer to complete a survey (97% response rate). The final sample was distributed among the different tourist operations as displayed in figure 4.

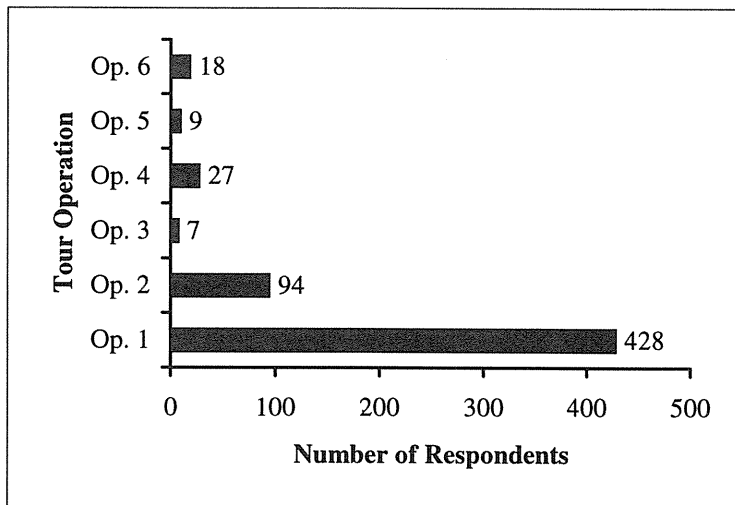


Figure 4. Number of visitors surveyed on each tourist operation

3.7 On-site Observations

In addition to the visitor surveys, an observation form accompanied researchers on each trip to Whitehaven Beach. The observation sheet was used to record information which included details about the tour operator, setting visited, amount of time spent on the beach by visitors, weather conditions, the number of vessels and people observed in each setting, and the activities of seaplanes and helicopters. Refer to appendix 4 for a copy of the observation form. The collection of this observational data was important because the number of boats, aircraft and other human-made structures in the water and on the beach are all 'social' conditions which may have an influence upon visitors and their experiences (Shafer et al. 1998). Observations made it possible to assess the relationship between perceived conditions (perceptions of aircraft activity/vessels and crowding) with recorded observations of conditions present during people's visit to Whitehaven Beach. On-site observations were not recorded for Operators 3 and 6.

3.8 Interest Group Survey

Members of local interest groups were contacted by mail and asked to complete a short survey regarding their perceptions and views of Whitehaven Beach and current issues. The Whitsundays Coastal Advisory Committee and QPWS provided a contact list of local interest group members. Forty surveys were sent out, and 20 were returned completed (in a stamped-addressed envelope). Neuman (1994) noted that a response rate of between 10 and 50% is common for this type of mail survey. Refer to appendix 5 for a copy of the interest group survey and information letter sent to local members.

It should be noted that not all interest group members were listed on the contact list supplied by the Whitsundays Coastal Advisory Committee and QPWS. As such, the sample obtained for the purpose of this study was not representative of the local interest group population or of local residents' views. The survey simply was aimed at providing a richer understanding of local perceptions of the present condition and management of Whitehaven Beach. Results from the interest group survey are found in appendix 6 and shall be referred to throughout the discussion of results.

3.9 Data Analysis

Survey questions and observational records were classified, coded and entered into SPSS (Statistical Package for Social Scientists—Version 7). Data were treated in two ways. Firstly data were summarised to provide a basic description of the sample and how they scored individual items. Secondly, relationships were tested among different variables and user types.

Only statistically significant differences are reported. In most cases differences were examined using chi-square or ANOVA.

To examine the 16 benefit items (experience scale), a principal components Factor Analysis with Varimax Rotation was conducted. For this study factors were retained with an eigenvalue higher than 1.00. Variables loading 0.4 or higher were interpreted as representing a factor. To test the potential utility of these scales the reliability coefficients were examined with Cronbach's Alpha.

A K-Means Cluster Analysis was used to group people into like categories, using the factored benefit domains as independent variables. This multivariate statistical technique was used to profile visitors into groups searching for similar types of recreational experiences. Experience types were then compared across factors such as socio-demographic characteristics, previous visitation, values, perceived conditions and satisfactions.

3.10 Limitations of the Investigation

This was an exploratory study to identify visitors experiences and the potential influence of conditions that may have an effect upon people's use and amenity whilst at Whitehaven Beach. Before discussing the findings several limitations should be noted.

Firstly data was collected during the low tourist season. Because this study was site specific, and conducted with time limitations, it was particularly challenging to obtain a reasonable sample size. The numbers of passengers on tourist boats were below the licensed carrying capacity. On smaller operators, some trips only carried half a dozen passengers, and there were days on the large catamaran (Operator 1) when only 65–70 people were onboard. In peak season this particular operator drops an average of 200 to 300 people daily at Whitehaven Beach, and smaller boats run to full capacity. As such, the data-collection phase was a lengthy process, and it was difficult to obtain an equal cross representation of passengers from small versus large tourist vessels.

In addition, weather conditions were particularly poor. Results will show that only 12% of the sample experienced fine, moderate weather conditions during their Whitehaven Beach trip. During the data-collection period that extended through March and April, four clear days were recorded. A tropical cyclone also hindered the field research. For one week many smaller tourist boat operators called off their trips. These bad weather conditions also were reflected in the many trip cancellations by potential Whitehaven Beach visitors.

Administering social surveys in a 'wet' environment did not come without some interesting challenges. On smaller vessels it was practically impossible for respondents to complete surveys during their return trip because of the spray from rough sea conditions wetting surveys. On certain days, some passengers were simply not approached because they were suffering from seasickness. To combat these rough conditions, surveys were administered on boats before departure, in the calm of Whitehaven Bay. Due to poor weather conditions and the low tourist season, the number of aircraft overflights and events were limited. As such results do not reflect the peak airtour season at Whitehaven Beach.

Finally, it was not possible to survey visitors from the different Whitehaven Beach settings because of the difficulties in trying to get to these settings. Tour boat operators did not visit Settings 3 and 4. Observations also showed that other recreational boaters didn't often use these settings. A trip to Tongue Point was difficult to plan in advance. We were aware that some smaller operators were more likely to visit Tongue Point, however the final destination (setting to be visited) was usually a last-minute decision made by the skipper on the day.

Despite these difficulties in obtaining the sample, some interesting and informative data were collected. Results are described and discussed in the following chapters.

4.0 RESULTS

4.1 A Description of Visitors to Whitehaven Beach

A total of 583 visitor surveys were analysed for the study. Of the sample 56% (n = 314) were female and 44% were male (n = 244).

The different age categories of respondents are displayed in figure 5. The majority of visitors surveyed were aged between 20 and 29 years (40%). For the entire sample the mean age was 37 (range 15 to 79 years of age). Most respondents had completed a secondary level of education (31%), 31% possessed some university or technical qualifications and 35% held a university or technical degree (see table 2).

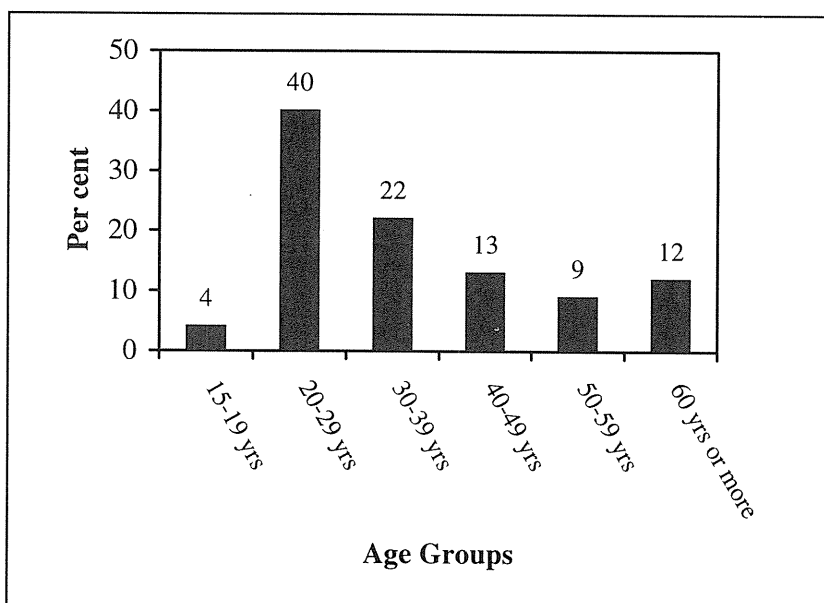


Figure 5. The age distribution of visitors to Whitehaven Beach

Table 2. Highest level of education achieved by respondents

Level of Education	Frequency	Per cent
Primary	8	1.5
Secondary	173	32.0
Some university or technical	168	31.1
University or technical	192	35.5
Total	541	100.0

As displayed in figure 6, four per cent of the sample were local residents visiting Whitehaven Beach, 46% indicated that they were Australian citizens, and 50% classified themselves as an international visitor. Of the Australian respondents 35% resided in Queensland, 32% were from New South Wales and 21% lived in Victoria (see table 3). Table 4 displays the country of citizenship of international visitors to Whitehaven Beach. A substantial number of international visitors were British (41%), 21% were European and a further 21% were visitors from North America or Canada.

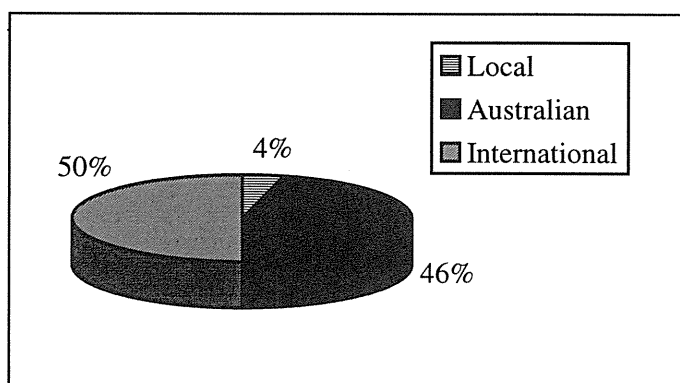


Figure 6. Visitors' place of origin

Table 3. The states in which visitors to Whitehaven Beach resided

States of Australia	Frequency	Per cent
Queensland	94	34.7
New South Wales	87	32.2
Victoria	58	21.4
South Australia	13	4.8
Tasmania	10	3.4
Western Australia	5	1.9
Northern Territory	3	1.2
Australian Capital Territory	1	0.4
Total	271	100.0

Table 4. The country of citizenship of visitors to Whitehaven Beach

Country	Frequency	Per cent
British/Irish	116	41.4
North American/Canadian	60	21.4
European	59	21.1
Japanese	22	7.8
South African	7	2.5
Eastern European	5	1.8
Asian	5	1.8
New Zealand	4	1.4
South American/Mexican	1	0.4
Middle East	1	0.4
Total	280	100.0

Approximately 36% of respondents travelled to Whitehaven Beach with their partner or spouse. Friends (19.5%) or family members (19.1%) accompanied almost 40% of passengers surveyed. Eighteen per cent of respondents were part of an organised group or club, whilst five per cent of the sample had travelled alone to Whitehaven Beach (table 5). The mean number of people in a group was \bar{X} 9.38 (median = 2).

4.2 Previous Visitation to the Whitsunday Region and Whitehaven Beach

Respondents were asked whether they had previously visited the Whitsundays region. Results presented in table 6 reflect that 78% (n = 445) had never been to the Whitsundays region, whilst 23% (n = 127) reported that they had on prior occasions visited a Whitsunday reef or island area. Ten per cent of these respondents had travelled to the Whitsundays region once before, whilst almost nine per cent had visited between two and five times.

Table 5. The types of groups that visitors to Whitehaven Beach travelled with

Type of Group	Frequency	Per cent
Self	31	5.5
Partner or spouse	203	36.3
Family	107	19.1
Friends	109	19.5
Organised group or club	102	18.2
Business associates	7	1.3
Total	559	100.0

Table 6. Previous visitation to the Whitsundays region

Number of Previous Visits	Frequency	Per cent
Never visited the Whitsundays region	445	77.8
Visited once	60	10.5
Visited 2–5 times	49	8.6
Visited 6–25 times	15	2.6
Visited more than 25 times	3	0.5
Total	572	100.0

Table 7 shows that thirty-six per cent of respondents who had previously visited the Whitsundays region had done so between one and five years earlier and 19% had travelled to the area within the past 12 months.

Table 7. Respondents' last visit to the Whitsundays region (n = 67)

Last Visit to the Whitsundays region	Per cent
In the last 12 months	19.0
Between 1 and 5 years ago	36.0
Between 6 and 10 years ago	21.0
More than 10 years ago	24.0

Visitors were also questioned as to whether they had previously visited Whitehaven Beach. Approximately 10% of respondents (n = 55) indicated that they had previously travelled to Whitehaven Beach, with most having visited between one and five times (8%). For 90% of the sample it was their first trip to Whitehaven Beach (see table 8).

Table 8. Number of previous visits to Whitehaven Beach by respondents

Number of Previous Visits	Frequency	Per cent
Never visited Whitehaven Beach	522	90.5
Visited once	27	4.6
Visited 2–5 times	20	3.5
Visited 6–25 times	7	1.2
Visited more than 25 times	1	0.2
Total	577	100.0

Table 9 illustrates that 45% of respondents who had been to Whitehaven Beach, had visited between one and five years earlier, whilst 34% had travelled there within the past 12 months.

Further analysis showed that Australian respondents, as opposed to visitors from abroad, ($X^2 = 23.98$, $p < 0.001$), and females in comparison to males ($X^2 = 4.67$, $p < 0.05$) were more likely to have visited Whitehaven Beach previously.

Table 9. Respondents' last visit to Whitehaven Beach (n = 55)

Last Visit to Whitehaven Beach	Per cent
In the last 12 months	34.5
Between 1 and 5 years ago	44.8
Between 6 and 10 years ago	10.3
More than 10 years ago	10.4
Total	100.0

4.3 A Comparison of Tour Operators and Differences in Visitor Characteristics

For comparative purposes, the five tourism boats used in this study have been divided into two categories, 'large' and 'small' operations, based on the length of the vessel and the number of passengers they were licensed to carry. Operator 1 was regarded as a large operation, whilst operators 2, 3, 4 and 5 were classified as small operations. Of the sample, 76% travelled on the large operation and 24% visited Whitehaven Beach on small vessels.

Differences were apparent between the large and smaller operations with regards to passenger characteristics (see table 10). Results indicated that those travelling with small operations tended to be younger (20–29 years), ($X^2 = 68.82$, $p < 0.001$), and were more likely to possess a university or technical degree ($X^2 = 13.09$, $p < 0.01$). The majority of visitors who were accompanied by a partner, spouse or members of their family travelled on the larger commercial operation, whereas people who were alone or with friends were more likely to have visited Whitehaven Beach on one of the smaller boats ($X^2 = 57.96$, $p < 0.001$). A higher percentage of international tourists chose to travel to Whitehaven Beach with smaller operations, whereas Australian visitors mostly used the larger operation as their means of transportation to the beach.

It has been suggested that a 'maturing process might be occurring in some visitors to the Great Barrier Reef leading them to choose smaller operations for their second/third trip (Shafer et al. 1998). This theory is based on visitors having an increased familiarity with an area or a possession of confidence in their ability to undertake ocean travel. To assess this concept, visitors were asked whether they had, on previous visits to Whitehaven Beach, travelled with a different operator and, if so, why? Fifty respondents indicated that they had travelled with a different operator previously. Reasons given for choosing a different operator on this occasion included convenience, safety and the size of the group they were travelling with. According to results shown in table 11, the majority of repeat visitors to Whitehaven Beach were more likely to have travelled on the larger operation. Initially, these results do not support suggestions of a maturing process occurring with repeat visitors to Whitehaven Beach. This finding however should be viewed with caution due to the small sample of previous visitors, and the bad weather conditions experienced during sampling which may have predisposed some people to choose a larger operation for reasons of comfort.

4.4 Expectations of Whitehaven Beach

Respondents were questioned about the types of experiences they expected to have during their visit at Whitehaven Beach. The most popular responses are displayed in table 12 and a list of all responses may be found in appendix 7. The three most sought-after experiences were to go swimming and/or snorkelling (20%), see the pure white silica sand/beach (19%) and to relax and lie in the sun (16%). A smaller percentage of respondents also expected to have fun, enjoy good weather, visit a quiet natural place that was uncommercialised, and view great scenery.

Table 10. Type of tour operator and differences in visitor characteristics

Visitor Characteristics	Type of Operation		test statistic	p value
	Large (n = 428)	Small (n = 137)		
Age group				
15–19	2.5%	8.6%	$x^2 = 68.82$	p<0.001
20–29	29.9	64.1		
30–39	25.1	15.6		
40–49	15.0	6.3		
50–59	11.9	2.3		
60 years or more	<u>15.5</u>	<u>3.1</u>		
	100%	100%		
Level of education				
Primary	1.8%	0.8%	$x^2 = 13.09$	p<0.01
Secondary	35.9	21.6		
Some university or technical	30.7	30.4		
University or technical degree	31.7	47.2		
	100%	100%		
Group travelled with				
Self	3.7%	12.2%	$x^2 = 57.96$	p<0.001
Partner or spouse	38.3	24.4		
Family	24.1	5.3		
Friends	14.6	35.1		
Organised group or club	18.0	21.4		
Business associates	1.2	1.5		
	100%	100%		
Place of origin				
Australian	60.5%	18.3%	$x^2 = 70.89$	p<0.001
International	39.5	81.7		
	100%	100%		

Table 11. Type of operation chosen by repeat visitors to Whitehaven Beach

Type of operation	Previous visitation to Whitehaven Beach	
	No (n = 508)	Yes (n = 50)
Large operation	75.6	74.0
Small operation	24.4	26.0
Total	100%	100%

4.5 Participation in Activities at Whitehaven Beach

Tour operators offered a range of activities to visitors whilst at Whitehaven Beach. A list of these activities and rates of participation by respondents is presented in table 13. The most popular activities included swimming, relaxing and sunbathing, taking photos, and going for beachwalks. Most operators spent approximately two hours on Whitehaven Beach. Findings suggest that during this time visitors spent an average of 58 minutes swimming, 52 minutes relaxing and sunbathing, 15 minutes taking photos and 33 minutes walking along the beach. Beach games such as volleyball, cricket, ball games and throwing frizbees were popular activities with 18% of the sample. An activity undertaken by nine per cent of visitors was bushwalking. Further investigation reflected that the majority of these people had visited Tongue Point. At Tongue Point a bush-track has recently been built leading up to a lookout over Hill Inlet. Other activities people said they participated in whilst at Whitehaven Beach included playing golf, building sandcastles and spending time meeting and talking to new people (4.3%).

Table 12. Expected experiences from visitation to Whitehaven Beach

Experiences	Frequency	Per cent
To swim/go snorkelling	134	20.5
See beach and silica sand	122	18.7
Relax and sunbathe	107	16.4
See and enjoy the water	51	7.8
Experience nature and enjoy surroundings	46	7.0
Peacefulness and quiet	41	6.3
Enjoy good weather	36	5.5
Have fun	26	4.0
Views and scenery	26	4.0
Unspoiled, uncommercialised beach	20	3.1

Local interest group members were also asked about the activities they normally would participate in whilst visiting Whitehaven Beach. Swimming, beachwalks, relaxing and sunbathing, taking photos, birdwatching and fishing were the most popular activities (see appendix 6).

Table 13. Activities participated in by visitors whilst at Whitehaven Beach

Activities	% Participated (n = 583)	Average Time* (n = 344) (minutes)
Swimming	79.4	58
Relax/sunbathing	65.5	51
Taking photos	49.1	15
Beach walks	45.0	32
Snorkelling	31.0	31
Beach games	18.4	28
Bush/nature walks	8.7	45
Wildlife/bird watching	7.2	22
Other activities	4.3	36
Fishing	1.9	23

* Average time spent participating in activities was calculated as a % of time spent during a visit.

4.6 Images of Whitehaven Beach

Respondents were asked to describe, using three words or phrases, the Whitehaven Beach setting they visited. The purpose of this question was to understand the perceptions (images) people have of Whitehaven Beach after their visit. The 10 most popular words used by visitors to describe Whitehaven Beach are displayed in table 14. Words such as beautiful (12%), relaxing/calming (9%) and quiet/tranquil (8%) were used most often. Many respondents were impressed about the clean beach environment (8%) and mentioned the white silica sand (8%) and quality of the clear water (5%) they saw whilst visiting Whitehaven Beach. Unspoiled, untouched, undeveloped, scenic and panoramic were also images of Whitehaven Beach that were described by many visitors. Appendix 8 displays the entire list of words used by visitors to describe Whitehaven Beach.

Similarly, the most popular words used by local interest group members to describe Whitehaven Beach were spectacular/amazing; natural; beautiful; pristine; unique; pure white sand; crystal clear water; and a visual icon. Quiet/peaceful, unspoilt, and clean were also perceptions locals had of Whitehaven Beach (see appendix 6).

Table 14. Post-visitation images of Whitehaven Beach

Words used to describe Whitehaven Beach	Frequency	Per cent*
Beautiful, pretty	103	12.1
Relaxing, calming	73	8.6
Quiet, tranquil, peaceful	70	8.2
White sand (bright, white, silica)	68	8.0
Clean	62	7.3
Fantastic, awesome, magnificent, incredible	58	6.8
Water quality (blue, clear)	44	5.2
Unspoiled, untouched, undeveloped	44	5.2
Heavenly, magical, spectacular	39	4.6
Serene, scenic, panoramic	35	4.1

* Due to multiple responses percentages may add to more than 100%.

4.7 Values Ascribed to Whitehaven Beach

Visitors were asked to rate nine reasons why Whitehaven Beach may be valuable (see table 15). Overall, respondents felt that Whitehaven Beach was mostly valuable for its natural and ecological processes (\bar{X} 4.56), followed by the conservation (\bar{X} 4.47) and educational opportunities (\bar{X} 3.95) that are offered by the area. Of least importance to respondents were the value of economic opportunities (\bar{X} 2.76) and the spiritual meaning (\bar{X} 3.05) of Whitehaven Beach.

Table 15. The importance of values associated with Whitehaven Beach (n = 317)

Values of Whitehaven Beach	No value	Little value	No opinion	Some value	Extreme value	Mean	Std. dev.
Natural/ecological processes	0	1.3	8.9	22.5	67.4	4.56	0.71
Conservation values	0.6	2.6	11.3	20.4	65.0	4.47	0.84
Educational opportunities	2.9	6.1	16.8	41.4	32.7	3.95	1.00
Scientific research	3.2	7.7	27.4	31.3	30.3	3.78	1.06
Cultural heritage	6.2	4.2	31.3	26.7	31.6	3.73	1.13
Historical meaning	7.1	5.2	32.9	27.7	27.1	3.63	1.14
Recreational opportunities	9.5	16.4	9.1	38.5	26.5	3.56	1.30
Spiritual values	19.1	9.4	35.3	20.4	15.9	3.05	1.30
Economic opportunities	25.9	17.7	23.6	19.7	13.1	2.76	1.37

The majority of local interest group members rated that Whitehaven Beach was 'extremely important' to them (75%, n = 15). Conservation (\bar{X} 4.60); recreational opportunities (\bar{X} 4.50); natural/ecological processes (\bar{X} 4.45); and educational opportunities (\bar{X} 4.05) were valued the most by these respondents (see appendix 6). Of least importance were the spiritual values (\bar{X} 2.85); historical meaning (\bar{X} 3.00); scientific research (\bar{X} 3.10); and cultural heritage (\bar{X} 3.10) of the Whitehaven Bay area.

4.7.1 Differences in Values Ascribed to Whitehaven Beach based on Visitor Characteristics

There were significant differences between the importance of values ascribed to Whitehaven Beach and a visitors' place of origin. As viewed in table 16 international visitors held great value towards Whitehaven Beach as a place of spirituality. In comparison, Australian respondents were more likely to have no opinion about the spiritual values of Whitehaven Beach. Table 17 illustrates that Whitehaven Beach was valued more by Australian visitors as an area for scientific research, compared to the responses of visitors from abroad. Further analysis showed no significant differences among values based on respondents' demographic characteristics, previous visitation, or the type of tour operator they travelled with.

Table 16. A comparison of spiritual values held for Whitehaven Beach by international and Australian visitors

Citizenship	Spiritual values			test statistic	p value
	Little value	No opinion	Great value		
Australian	32.5	39.4	28.1	$X^2 = 9.64$	< 0.01
International	24.7	30.1	45.2		

Table 17. A comparison of values held towards Whitehaven Beach as a place of scientific research by international and Australian visitors

Citizenship	Scientific research			test statistic	p value
	Little value	No opinion	Great value		
Australian	12.0	19.6	68.4	$X^2 = 9.34$	< 0.01
International	10.1	35.1	54.7		

4.8 A Review of Visitors Experiences at Whitehaven Beach

4.8.1 Visitation Experiences Provided by Whitehaven Beach

Respondents were asked to evaluate how much each of the 16 benefit items, presented in table 18, were provided from their visit to Whitehaven Beach. ‘Seeing the beauty of Whitehaven Beach’ (\bar{X} 4.50), ‘being in a natural place’ (\bar{X} 4.33) and ‘viewing outstanding scenery’ (\bar{X} 4.23) were scored most highly as experiences received by Whitehaven Beach visitors. ‘Escaping normal routine’ (\bar{X} 4.31) and ‘rest and relaxation’ (\bar{X} 4.22) were also benefits seen as being well provided by the visit. In comparison ‘meeting new people’ (\bar{X} 2.59), ‘being physically active’ (\bar{X} 1.24) and ‘learning about the Great Barrier Reef’ (\bar{X} 1.34) were personal benefits that received the lowest ratings from respondents.

Table 18. Visitors’ evaluation of experiences at Whitehaven Beach

Benefit item	Not at all	Slightly	Some	High	Very high	Mean	Std. dev.
See the beauty of Whitehaven	0	1.8	5.9	32.7	59.6	4.50	0.69
Be in a natural place	1.1	2.0	11.1	34.3	51.3	4.33	0.83
Escape from normal routine	2.5	2.7	9.8	30.7	54.2	4.31	0.94
View outstanding scenery	2.0	2.9	12.1	36.0	47.1	4.23	0.91
To rest and relax	2.5	2.5	12.1	36.7	46.3	4.22	0.93
Experience an undeveloped environment	3.1	4.9	16.7	30.9	44.4	4.09	1.04
Experience something new and different	5.6	10.7	23.1	34.6	25.9	3.64	1.14
Be with others who enjoy the things that I enjoy	9.8	9.3	26.6	32.8	21.5	3.47	1.21
Experience some solitude	10.9	13.9	26.6	26.8	21.7	3.34	1.26
Have fun, be entertained	12.2	14.6	25.6	27.6	19.9	3.28	1.28
Have some excitement	6.2	12.8	42.4	28.5	10.1	3.23	1.01
Go to a place my friends haven’t been	24.6	9.7	16.0	23.1	26.6	3.17	1.53
Be close to friends and family	21.6	11.0	21.2	28.7	17.5	3.09	1.40
Learn from the GBR	19.1	19.3	27.2	18.4	16.1	2.93	1.34
Be physically active	16.1	20.1	30.2	21.6	12.1	2.93	1.24
Meet new people	23.9	23.3	30.2	14.8	7.8	2.59	1.22

To further examine the benefits received by Whitehaven Beach visitors a factor analysis was undertaken on the 16 experience items. This factor analysis yielded four experience domains

each of which received substantial loadings (0.4 or greater), (see table 19). Factor 1 was interpreted by six items, which reflect 'socially active' benefits. Having fun, being active, with other people best describes this domain. In relation to the other three benefit factors this was the lowest domain provided to visitors. The second factor was represented by four items, which allowed visitors to escape routine and relax in a scenic environment. This was the highest of the benefit domains received from visits to Whitehaven Beach and was named 'scenic escape'. Three items comprised the second ranking domain, 'experiencing nature'. This appeared to reflect that experiencing solitude in an undeveloped natural environment was provided to visitors. Factor IV, 'new excitement' was defined by three items associated with learning and experiencing something different and exciting.

Table 19. Four benefit domains received by visitors to Whitehaven Beach

Factor (Benefit items)	factor loading	mean* factor score	alpha
Factor I—Socially Active			
Be with others who enjoy what I enjoy	0.73		
Have fun, be entertained	0.72	3.08	0.75
Be close to friends and family	0.60		
Meet new people	0.60		
Be physically active	0.59		
Go to a place my friends haven't been	0.54		
Factor II—Scenic Escape			
View outstanding scenery	0.73		
See the beauty of Whitehaven Beach	0.63	4.31	0.61
To rest and relax	0.58		
Escape from normal routine	0.41		
Factor III—Experiencing Nature			
Experience some solitude	0.78		
Be in a natural place	0.67	3.92	0.66
Experience an undeveloped environment	0.64		
Factor IV—New Excitement			
Learn about the Great Barrier Reef	0.67		
Experience something new and different	0.65	3.26	0.58
Have some excitement	0.55		

* Mean is based on a five-point scale where 1 = not at all, 2 = slightly, 3 = some, 4 = high, 5 = very high.

4.8.2 Classifying Visitor Types Based on Experiences Provided by Whitehaven Beach

While it was important to understand the types of benefits Whitehaven Beach provided to visitors, it is also useful to group people into similar segments or types based on the levels of benefits received. Table 20 identifies four types (clusters) of visitors to Whitehaven Beach. The first group representing 17% (n = 81) of visitors, scored trip benefits relatively low compared to the other three groups. Although this segment received some rest and scenic opportunities, overall they didn't appear to gain too much from their trip. As such this group was named the 'passivists'. The second type of visitor was very different from members of the passivist group. In comparison these visitors received a great deal from each benefit domain. These 'socially active naturalists', as they were classified, comprised the largest group of 149 (32%) visitors. Type three represents a group of visitors who were escaping routine to relax and enjoy the natural beauty and scenery. This group of 136 (29%) visitors were thought of as the 'relaxed

sightseers'. The fourth type of visitor showed little in terms of experiences gained from new and exciting things or being socially active. These 106 (22%) visitors received benefits related to experiencing nature and escaping routine. This group was classified as the 'nature escapists'.

Table 20. Types (clusters) of Whitehaven Beach visitors based on how much each of the four benefit domains were provided

Benefit Domains	Visitor Clusters*			
	1 Passivists n = 81	2 Socially Active Naturalists n = 149	3 Relaxed Sightseers n = 136	4 Nature Escapists n = 106
Socially active	2.14	3.81	3.34	2.36
Scenic escape	3.69	4.70	4.19	4.43
Experiencing nature	2.83	4.45	3.53	4.44
New excitement	2.55	4.09	2.98	2.96

* Values represent group means based on a five-point scale of benefits provided by the trip where 1 = not at all, 2 = slightly, 3 = some, 4 = high, 5 = very high.

4.8.3 A Comparison of Visitor Types and Values Ascribed to Whitehaven Beach

It is helpful to analyse visitor types in terms of other factors that may be of relevance to management. An evaluation of visitor types in relation to the amounts of benefits received and ascribed values can be useful indicators for monitoring changes in use and perceptions over time. To extend our understanding of the types of visitors Whitehaven Beach attracts, analyses were undertaken to compare the four visitor groups (clusters) on their demographic characteristics, participation in various activities, the boat operator they chose to travel with and previous visitation to Whitehaven Beach. No significant differences were found between visitor types on these variables. There were however significant differences in the values they attributed to the Whitehaven Bay area.

Differences among the four types of visitors and the values they ascribed to the Whitehaven Beach area are presented in table 21. The passivist group were more likely to have either no opinion about the values of Whitehaven, or rated potential uses as having less value in comparison to other visitor types. Specifically passivists had no real opinion about the values of cultural heritage (51%), scientific research (44%), spiritual values (47%) or historical meaning (48%) in relation to Whitehaven Beach. Although the majority of passivists attributed great value towards the natural ecological processes (72%) and educational opportunities (60%) offered by the Whitehaven Bay area, this group still represented a lower proportion of visitors that placed value on these items. Comparatively, the socially active naturalists represented the group of visitors who were most likely to feel that Whitehaven Beach was very valuable in terms of its natural/ecological processes (95%), educational opportunities (85%), cultural heritage (80%), scientific research (78%) and historical meaning (77%). To some extent this finding reflects the experience traits of this particular type of visitor; who was enthusiastic about the importance of natural, environmental and social benefits of Whitehaven Beach. Nature escapists represented the largest proportion of visitors that placed great value towards the natural/ecological processes (96%) of the Whitehaven Beach area. This assists with validating the benefit package of the nature escapists, who received most from experiencing the natural environment whilst at Whitehaven Beach. Only a proportion of relaxed sightseers felt that Whitehaven Beach was valuable for scientific research (50%), cultural heritage (50%) and historical meaning (46%). Overall these findings do suggest that visitors are different in their approach to experiencing and valuing the Whitehaven Beach environment.

Table 21. A comparison of values ascribed to Whitehaven Beach based on benefit cluster membership

Values of Whitehaven Beach	Visitor Clusters				test statistic	p value
	Passivists	Socially Active Naturalists	Relaxed Sightseers	Nature Escapists		
<u>Natural/ecological processes</u>						
Little value	3.9	1.1	1.5	-	$X^2 = 23.40$	<0.001
No opinion	23.5	3.4	7.4	4.3		
Great value	72.5	95.4	91.2	95.7		
<u>Scientific research</u>						
Little value	14.0	7.0	16.7	5.7	$X^2 = 24.59$	<0.000
No opinion	44.0	15.1	33.3	27.1		
Great value	42.0	77.9	50.0	67.1		
<u>Cultural heritage</u>						
Little value	14.3	3.5	10.3	13.0	$X^2 = 31.63$	<0.000
No opinion	51.0	16.3	39.7	29.0		
Great value	34.7	80.2	50.0	58.0		
<u>Spiritual values</u>						
Little value	37.3	22.1	33.8	24.3	$X^2 = 17.64$	<0.01
No opinion	47.1	29.1	36.8	35.7		
Great value	15.7	48.8	29.4	40.0		
<u>Educational opportunities</u>						
Little value	14.0	2.4	5.9	14.5	$X^2 = 17.89$	<0.01
No opinion	26.0	12.9	22.1	10.1		
Great value	60.0	84.7	72.1	75.4		
<u>Historical meaning</u>						
Little value	18.0	4.7	10.4	14.3	$X^2 = 29.15$	<0.001
No opinion	48.0	18.6	43.3	34.3		
Great value	34.0	76.7	46.3	51.4		

*Little Value = No Value + Little Value; No Opinion = No Opinion; Great Value = Some Value + Extreme Value

4.9 An Evaluation of Conditions Experienced at Whitehaven Bay

4.9.1 A Summary of On-site Observations Recorded at Whitehaven Beach

On-site observations were made during each survey trip to Whitehaven Beach. Observations made it possible to record details about the types of activities and conditions under which the surveys were being administered. The following is an overview of the types of conditions present during the data collection phase.

Setting Visited

The setting visited at Whitehaven Bay was recorded for each trip. As viewed in figure 7, the majority of respondents (86%) visited Setting 2 (High Use, southern end) of Whitehaven Beach. Eleven per cent of the sample was taken to Tongue Point (Moderate Use, northern point), and three per cent spent time at Setting 3 (Moderate Use, middle of the beach).

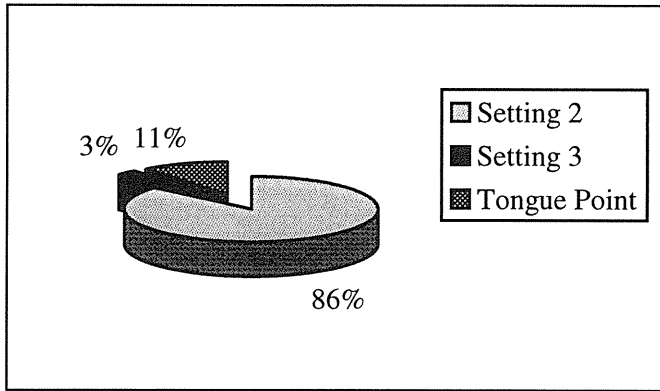


Figure 7. Settings visited by respondents

Weather Conditions

The types of weather conditions experienced by respondents during their visit to Whitehaven Beach are displayed in figures 8, 9 and 10. Figure 8 illustrates that 12% of the sample ($n = 66$) experienced clear (fine) conditions whilst visiting Whitehaven Bay. For sixty-five per cent of the sample the weather was cloudy or overcast, and 23% had rainy conditions during the time they spent on the beach. Figure 9 reflects that sea conditions in Whitehaven Bay were moderate to smooth during most people's visit (97% of respondents). Conditions in exposed water was very different. Eighty-two per cent of visitors surveyed experienced moderate to rough sea conditions on their journey to and from Whitehaven Beach (figure 10). The average wind strength recorded over the different trips was 22 knots. Overall weather conditions were not favourable during data collection. On most trips the seas were moderate to rough, making the journey uncomfortable for many passengers.

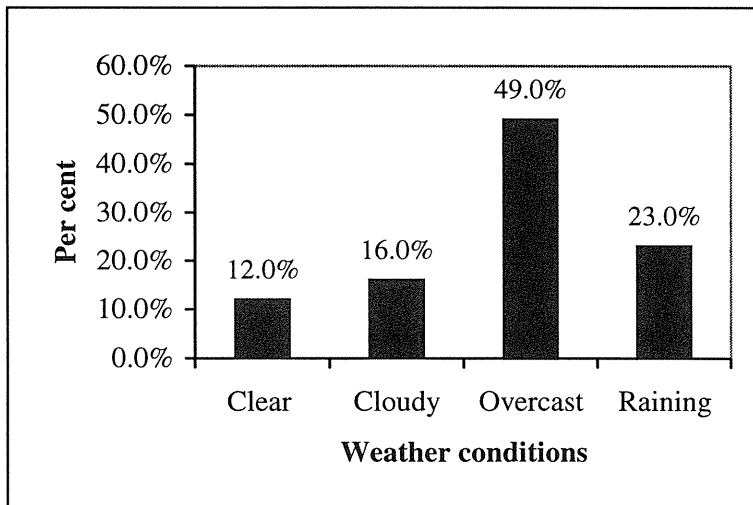


Figure 8. Weather conditions experienced at Whitehaven Bay by visitors

Numbers of People, Aircraft and Vessels Recorded by Setting

Table 22 displays the average (mean) number of people and vessels observed in each of the Whitehaven Bay settings over the surveying period. In Setting 2 and Setting 3 an average of 137 people (\bar{X} 136.97) and five people (\bar{X} 4.86) were counted respectively. In Setting 2 the mean number of boats recorded included one large vessel (Operator 1), three medium vessels (\bar{X} 2.91) and two small boats (\bar{X} 1.79). Approximately four yachts (\bar{X} 4.43) were also noted on any one visit to Setting 2. Very little activity by vessels or people occurred at any of the other Whitehaven Beach settings. Due to the distance between settings it was not possible to count the

number of people and smaller vessels at Tongue Point when Setting 2 was visited. Therefore the numbers recorded at Tongue Point (table 22) were taken only on those trips to the northern end.

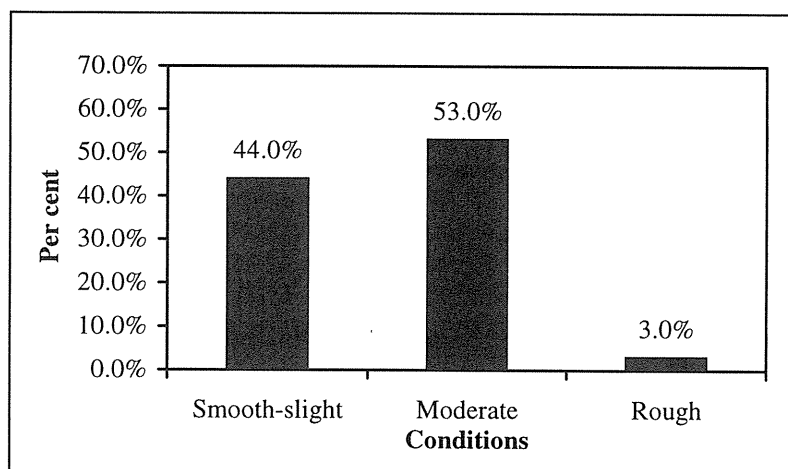


Figure 9. Sea conditions experienced in Whitehaven Bay by visitors

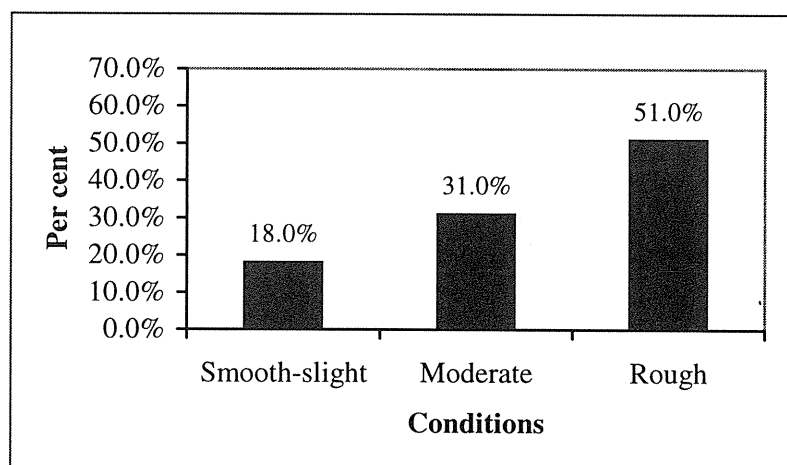


Figure 10. Sea conditions experienced in exposed water by visitors to Whitehaven Bay

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Table 22. Average numbers observed in each setting of Whitehaven Bay

Visitation by:	Setting 2 \bar{X}	Setting 3 \bar{X}	Setting 4 \bar{X}	Setting 5 \bar{X}	Setting 3 Tongue Pt. \bar{X}
People on beach	136.97	4.86	0		17.85
Large motorised vessels (15 – < 35 metres)	1.47	0			0
Medium motorised vessels (6 – < 15 metres)	2.91	0.12	0.33		1.00
Small motorised vessels (< 6 metres)	1.79	0.28	0		0.24
Yachts & other sailing craft	4.43	0.88	0.34		0.84

A Record of Aircraft Overflights and Events

Aircraft activity by seaplanes and helicopters is displayed in table 23. During visits to Whitehaven, the mean number of observed seaplane overflights was \bar{X} 1.3 (range 0 to 4) and

\bar{X} 1.00 helicopter flyover (range 0 to 3). Seaplane events (defined as take-offs and landings) ranged from 0 to 3, with an average of one seaplane event (\bar{X} 1.12) per visit. Only one helicopter event was recorded during the 16 research trips to Whitehaven Beach. See appendix 9 for the number of aircraft observations by settings visited for each research trip. To clarify, observations show that 52% of respondents were on the beach when there was one seaplane overflight, 16% may have experienced three flyovers and for 23% no seaplanes flew overhead during their visit (see figure 11). Figure 12 reflects that almost half (49%) of the sample experienced no seaplane events (take-offs and landings), whilst 23% were visiting Whitehaven Beach during the time when three seaplane events were recorded.

Table 23. Aircraft observations at Whitehaven Beach

Aircraft Observations	Mean \bar{X}	Range	
		Minimum	Maximum
Seaplane flyovers	1.30	0	4
Seaplane events	1.12	0	3
Helicopter flyovers	1.00	0	3
Helicopter events	-	0	1

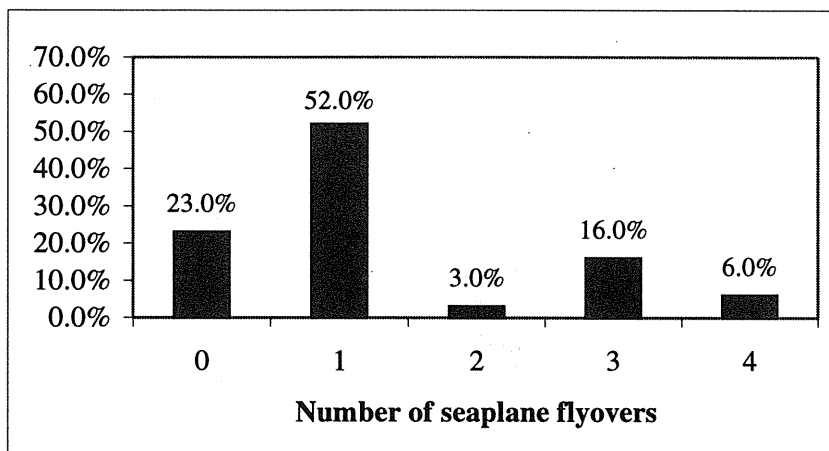


Figure 11. Visitors experiencing seaplane overflights

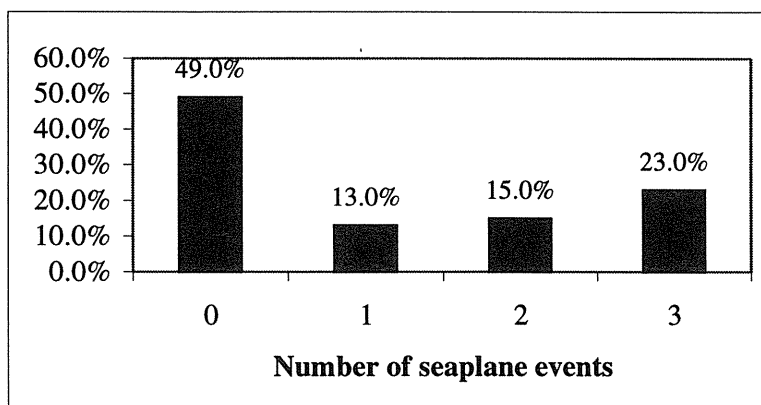


Figure 12. Visitors experiencing seaplane events

Forty-three per cent of respondents experienced no helicopter overflights during their visit to Whitehaven Bay (figure 13). Thirty per cent were visiting when there was one helicopter overflight, and 16% were on the beach when three helicopters flew over their setting. For 98%

of respondents surveyed there were no helicopter landings on the beach during their visit, therefore only 2% of the sample may have experienced the one helicopter event that occurred during the surveying period. Refer to figures 13 and 14.

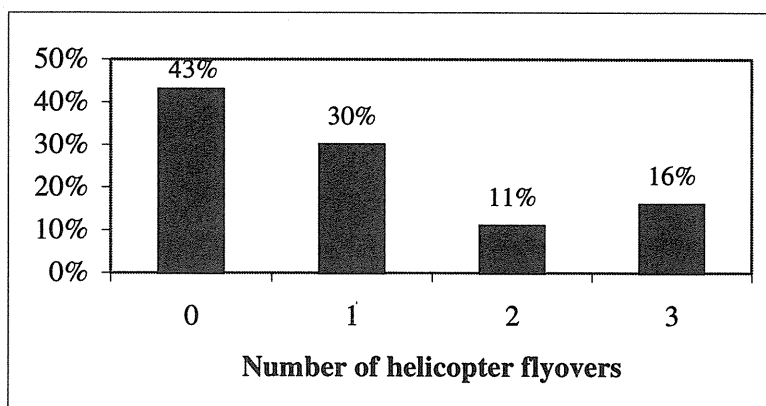


Figure 13. Visitors experiencing overflights by helicopters

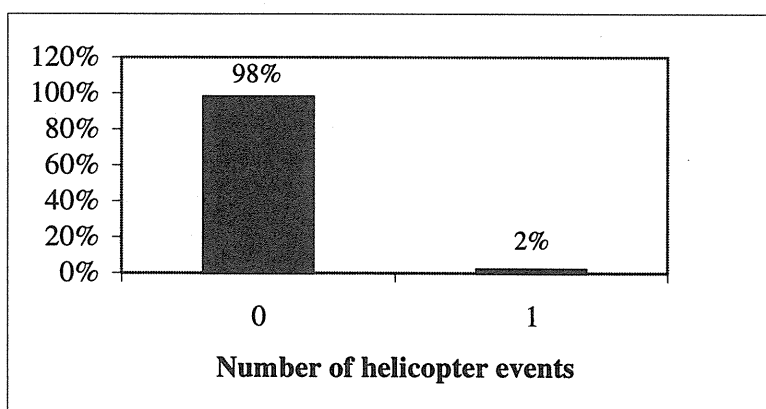


Figure 14. Visitors experiencing helicopter events

4.9.2 Aircraft Activity Levels and Sound Impacts

To complement the current investigation, Mary Hamilton, honours student from James Cook University, undertook research to provide quantitative information describing actual levels of aircraft use and sound impact along Whitehaven Beach. Data was collected in October and December of 1998; a low season for air tours to Whitehaven Beach. Summaries of Hamilton's (1999) findings are presented in appendix 10, and are briefly described below.

The most common type of aircraft observed at Whitehaven Bay were seaplanes followed by helicopters, other light aircraft and high altitude jets. Hamilton (1999) found the busiest time of day for aircraft tours to Whitehaven Beach was between 11.30 a.m. and 12.30 p.m. During this time the frequency of flights ranged from 4.7 per hour to 6.2 per hour. These records were notably higher than the observed number of aircraft overflights and events taken during the visitor-surveying period in March and April. Hamilton (1999) discovered that Settings 3, 4 and Hill Inlet (Setting 5) were significantly busier than Setting 2 at this time of day. Additionally findings showed that Setting 2 was the least frequented site by aircraft activity. Hill Inlet (Setting 5) was busier than all other sites towards the end of the day.

Although Setting 2 experienced the lowest number of aircraft events, many more watercraft events were recorded in comparison to other Whitehaven Beach settings. This is consistent with

on-site observations made during the surveying period of the current study. The average number of people observed in Setting 2 (\bar{X} 124) was significantly higher than other settings.

Analysis showed there to be no significant difference between the average or absolute maximum decibel levels experienced at each setting. All settings received similar absolute maximum decibel levels at different times. The most common decibel level recorded was 62 dB (median = 64). Seaplane take-off flyovers followed by helicopter take-off flyovers created the greatest sound impact. However, far fewer helicopter events occurred when compared to the frequencies of seaplane events. Overall 71% of aircraft events effected three or more of the Whitehaven Bay settings.

Hamilton (1999) notes that data was collected during a low season, and as such results are not representative of all activity levels experienced throughout a year.

4.9.3 The Influence of Conditions on Experiences at Whitehaven Beach

Respondents were questioned about things that may have ‘added to’ or ‘detracted from’ their enjoyment during the time they spent on Whitehaven Beach. The purpose of this question was to identify any intrusions or conditions that may have had an influence on visitors social amenity. Seventy per cent of the sample indicated that there were things that enhanced their enjoyment. The most popular reasons mentioned as positive influences are displayed in table 24. Natural qualities such as the pure white beach sand (20%), the quality of the water (13%), the unspoiled natural environment (12%) and the cleanliness of the beach (12%) were attributes of Whitehaven Beach that people received most enjoyment from. The quiet and peacefulness of the beach and being in an uncrowded environment also enhanced visitors’ experiences whilst at Whitehaven. Additionally respondents enjoyed seeing goannas, turtles and dolphins during their visit to the area. The services offered by the crew of tour operators and shade tents supplied by Operator 1 received positive comments also. See appendix 11 for a complete list of things that added to visitors’ enjoyment of Whitehaven Beach.

Table 24. Things that added to visitors’ enjoyment whilst on Whitehaven Beach

Things that added to enjoyment	Frequency	Per cent*
White silica sand and beach	120	19.9
Quality of the water (clean, clear)	77	12.8
Natural, unspoiled, uncommercialised	73	12.1
Cleanliness of Whitehaven Beach	70	11.6
Wildlife and marine-life (turtles, goannas)	39	6.5
Crew friendliness and information	34	5.6
Beach activities (swimming, snorkelling)	33	5.5
Quiet and peacefulness	29	4.8
Uncrowded	26	4.3
Shade tents on beach	19	3.2

* Due to multiple responses percentages may add to more than 100%

Respondents were also queried about things that ‘detracted’ from their enjoyment whilst at Whitehaven Beach. Twenty-three per cent of respondents said that there were things that detracted from their enjoyment; the most common responses are presented in table 25. Weather conditions (35%), lack of shade on the beach (12%), seasickness (9%) and perceived crowding (8%) were reasons cited as detracting from people’s experiences during time spent on Whitehaven Beach. Some respondents also mentioned a lack of toilet facilities. See appendix 12 for a list of things that detracted from visitors’ enjoyment of Whitehaven Beach.

4.9.4 Perceived Conditions (Aircraft, Vessels and Crowding) of Whitehaven Beach

Respondents were asked to assess how they felt about ‘the number’, ‘the distance from’, and

'the noise of' aircraft, vessels, yachts, and other people during their visit to Whitehaven Beach. The ratings of these conditions may be viewed in tables 26, 27 and 28. According to responses presented in table 26, the majority of visitors (91% – 93%) felt that the number of vessels and aircraft seen along Whitehaven Beach during their visit were 'about right' or indicated that these craft 'didn't matter to them'. Twelve per cent of the sample felt that there were 'too many' people on Whitehaven Beach during their visit.

Table 25. Things that detracted from visitors' enjoyment whilst at Whitehaven Beach

Things that detracted from enjoyment	Frequency	Per cent*
The weather	44	34.6
Lack of shade	16	12.0
Seasickness	11	8.7
Too many people, too crowded	10	7.9
Lack of change rooms and toilet facilities	7	5.5
Poor service related to operator	7	5.5

* Due to multiple responses percentages may add to more than 100%.

Table 26. Visitors' perceptions of the number of aircraft, vessels and people at Whitehaven Beach

The number of visits by:	Too few	About right	Too many	Didn't matter to me
Aircraft (helicopters, seaplanes)	4.8%	44.5%	3.9%	46.8%
Large motorised boats (15–35 m)	1.9%	51.7%	6.9%	39.6%
Medium motorised boats (< 15 m)	2.2%	52.4%	4.5%	40.8%
Small motorised boats (< 6 m)	3.4%	49.6%	4.3%	42.7%
Yachts and sailing boats	3.5%	51.2%	4.8%	40.4%
Other people	2.6%	48.1%	12.0%	37.2%

Respondents indicated how they felt about the 'distance away' from aircraft, motorised boats and yachts, and other people whilst on Whitehaven Beach. As displayed in table 27, most of these visitors (95%) reported that the distance from these crafts and other people on the beach 'didn't matter to them', or was 'about right'. Nine per cent of respondents rated other people as being 'too close' on the beach.

Table 27. Perceptions about the distance away from aircraft, vessels and other people on Whitehaven

The distance away from:	Too far	About right	Too close	Didn't matter to me
Aircraft (helicopters, seaplanes)	1.5%	49.9%	3.5%	45.1%
Large motorised boats (15–35 m)	0.9%	51.4%	5.6%	42.1%
Medium motorised boats (< 15 m)	0.9%	51.9%	4.1%	43.1%
Small motorised boats (< 6 m)	1.1%	51.6%	4.1%	43.2%
Yachts and sailing boats	1.3%	51.8%	3.7%	43.0%
Other people	0.7%	49.4%	9.1%	40.7%

Results presented in table 28 show that noise from motorised vessels, aircraft (seaplanes and helicopters) and other people 'didn't matter' or were rated 'about right' by over 92% of respondents. For almost six per cent of the sample, aircraft were 'too noisy' and large vessels (< 35 m) were 'too loud' (4%) during their stay at Whitehaven Beach. Only three per cent of visitors surveyed rated other people as being 'too noisy'.

Table 28. Ratings of noise from aircraft activity, vessels and other people

The noise from:	Too noisy	About right	Too quiet	Didn't matter to me
Aircraft (helicopters, seaplanes)	5.8%	47.2%	1.7%	45.3%
Large motorised boats (15–35 m)	3.7%	49.4%	1.5%	45.5%
Medium motorised boats (< 15 m)	2.4%	50.1%	1.7%	45.8%
Small motorised boats (< 6 m)	2.6%	49.8%	1.9%	45.7%
Other people	3.2%	53.1%	1.1%	42.6%

The effect of visitor characteristics (past visitation, benefits received, demographics, cluster group) on evaluations of aircraft, vessels and other people were examined. No significant differences between these variables were found.

Analysis was also undertaken to assess whether people who experienced 'any' aircraft event/overflight versus those who experienced 'none' perceived impact from aircraft activity differently. Results showed some significant differences between visitors who experienced one or more aircraft overflight /event and those who experienced none, in their perceptions of noise from aircraft activity. Tables 29 and 30 indicate that visitors who experienced one or more event and overflight were more likely to perceive aircraft as being 'too noisy' when compared to those who experienced no aircraft activity during their stay.

Table 29. Perceptions of aircraft noise between visitors who experienced no events and those who experienced one or more event

Perceptions of aircraft noise	Number of aircraft events		test statistic	p value
	No events (n = 250)	One or more (n = 260)		
Too loud	3.6%	8.1%	$X^2 = 10.72$	< 0.05
About right	48.4%	44.2%		
Too quiet	3.2%	0.4%		
Didn't matter to me	44.8%	47.3%		

Table 30. Perceptions of aircraft noise between visitors who experienced no aircraft overflight versus those who experienced one or more overflight

Perceptions of aircraft noise	Number of aircraft overflights		test statistic	p value
	No overflights (n = 119)	One or more (n = 391)		
Too loud	3.4%	6.6%	$X^2 = 9.85$	< 0.05
About right	52.9%	44.2%		
Too quiet	4.2%	1.0%		
Didn't matter to me	39.5%	48.1%		

Further analysis showed no differences in visitors' perceptions of conditions (people, aircraft or vessels) dependent on the operator they travelled with or the setting of Whitehaven Beach visited.

Additionally, respondents were questioned as to whether any of the aircraft, boats or people at Whitehaven influenced their enjoyment, in either a positive or negative way, and if so how? Eighty-eight per cent indicated that these conditions had no influence on their enjoyment, whilst 12 per cent (n = 64) reported that some conditions did have an effect upon their experiences. Visitors reported both positive and negative experiences resulting from various conditions; the most popular of these are presented in table 31. Negative influences related to overcrowding, noise from aircraft flights and large boats. Positive experiences were received from watching the seaplanes and seeing other people enjoying themselves on the beach. Positive mention also was

made about the quiet and peaceful environment of Whitehaven Beach. Refer to appendix 13 for a list of conditions that influenced visitors' enjoyment of Whitehaven Beach.

Local members of interest groups were also asked about things that may have had an influence on their enjoyment of Whitehaven Beach from previous visits. Things that detracted from their enjoyment included: too many people, boats and jet skis, noisy airplanes and helicopters (see appendix 6). An increase in use of the area and perceived crowding in Setting 2 was also mentioned.

Table 31. Conditions that had an influence upon visitors' enjoyment at Whitehaven Beach

Positive Conditions	n	%	Negative Conditions	n	%
Enjoyed environment (no negative influences)	8	11.4	Too many people	16	22.8
Watching seaplanes	7	10.0	Aircraft noise	6	8.6
Watching other people/other people's enjoyment	6	8.6	Aircraft annoying	5	7.1
No noise, quietness	3	4.3	Noise large boats	5	7.1

4.10 Visitors' Satisfaction with their Whitehaven Beach Experience

4.10.1 Improvements to Whitehaven Beach

Respondents were asked to think about their visit to Whitehaven Beach and report anything that they felt could be improved. Over half of the sample (51%) felt that no improvements could be made, and indicated that they would like Whitehaven Beach to remain in its present state—undeveloped, natural and uncommercialised. The main suggestions for improvements are described in table 32. Most improvements were unrelated to the natural or social environment of Whitehaven Beach, and instead were a reflection of the service provided by the tour operator (10%), or the weather conditions (8%). Other suggestions for improvements included the provision of more shade whilst on the beach (10%), better toilet facilities (5%) and the construction of more bushwalking tracks (3%). It should be noted that no mention was made about reducing the number of visitors, boats or aircraft. Additionally, these Whitehaven Beach visitors did not want the development of tourist support facilities such as accommodation restaurants, bars, golf courses and so forth. See appendix 14 for a full list of suggested improvements by respondents.

Table 32. Suggested improvements to Whitehaven Beach by visitors

Improvements	Frequency	Per cent*
No improvements (leave beach natural)	180	51.0
Provision of shade on beach	37	10.5
Service of tour operator	35	9.9
Stay longer on beach	33	9.3
Better weather	27	7.6
Better toilet facilities	18	5.2
More information (island, coral, wildlife)	13	3.7
More bushwalking tracks	10	2.8

* Responses may add to more than 100% due to multiple responses.

In results of the local interest group survey, many respondents also indicated that they enjoyed the Whitehaven Beach environment as it stands today. However, they expressed concern about an increase in aircraft noise, large boats, people, development and rubbish in the future.

The majority of local respondents indicated that they had a 'good understanding' of the Whitsundays Plans of Management. Whilst many agreed that Whitehaven Beach is currently

'well managed', several said that they disagreed with the management plans to date. Suggested improvements in relation to the current management of Whitehaven Beach included the provision of moorings, better toilet facilities, more rangers on-site, retained access to Hill Inlet and allow visiting boats to spread out along the beach. Appendix 6 provides a summary of these findings.

4.10.2 Ratings of Trip Satisfaction by Visitors to Whitehaven

Figure 15 reflects that the majority (89%) of respondents rated their trip to Whitehaven Beach as a seven out of 10, or higher. Thirty-two per cent of respondents felt that their visit to Whitehaven Beach was excellent, and gave their visit a score of 10.

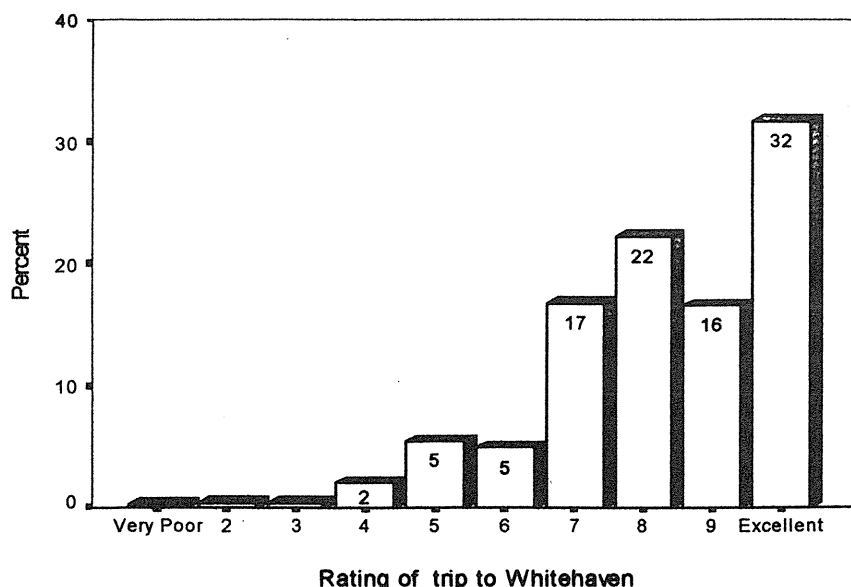


Figure 15. Rating of visit to Whitehaven Beach

Table 33 reflects that there was a significant difference among the four visitor groups (clusters) in their ratings of the trip to Whitehaven Beach. Based on a ten-point response format which ranged from 1 = very poor to 10 = excellent, the socially active naturalists were most likely to rate their visit to Whitehaven Beach very positively (\bar{X} 9.15). Relaxed sightseers (\bar{X} 8.12) followed by nature escapists (\bar{X} 8.04) also scored their Whitehaven experience highly, however the passivists rated their trip significantly lower in comparison to all other groups (\bar{X} 7.04). This result again reflects that although the passivist visitor did gain some positive experiences from their trip, they were quite indifferent about certain aspects of their Whitehaven Beach visit.

Table 33. A comparison of visitors rating of their trip to Whitehaven Beach based on benefit cluster membership

Trip Rating	Visitor Clusters*				test statistic	p value
	Passivists	Socially Active Naturalists	Relaxed Sightseers	Nature Escapists		
Overall trip score	7.04	9.15	8.12	8.04	F = 37.11	< 0.000

*Mean values are based on a ten-point scale where 1 = Very Poor to 10 = Excellent.

Respondents rated their satisfaction in regard to some of the services provided by the tour operator they travelled with. Overall visitors were very satisfied with staff friendliness and knowledge, however were less satisfied with the amount and quality of education and information that was provided during their trip to Whitehaven Beach. For most tourists visiting the reef, it is their tour operator who is in the best position to provide information about the

Marine Park environment and its management. See table 34 for satisfaction ratings.

Visitors were questioned about whether they would recommend a Whitehaven Beach trip to other people. Sixty-nine per cent said they definitely would and 27% indicated that they would probably recommend Whitehaven Beach to their friends and family. Three per cent said they were unsure and one per cent reported that they would not be making recommendations to visit the beach (see figure 16).

Table 34. Respondents' satisfaction with services provided by operators to Whitehaven Beach

Satisfaction for:	Not at all satisfied	Somewhat satisfied	No opinion	Very satisfied	Extremely satisfied
Value for money	3.5	20.8	12.8	41.5	21.4
Staff friendliness	0	4.4	3.8	47.8	44.1
Staff knowledge	0	5.0	13.2	46.1	35.6
Amount of education and information	7.0	17.1	32.1	31.1	12.7
Quality of education and information	7.3	16.8	32.7	29.8	13.3
Range of activities provided	1.3	15.6	20.0	42.9	20.3

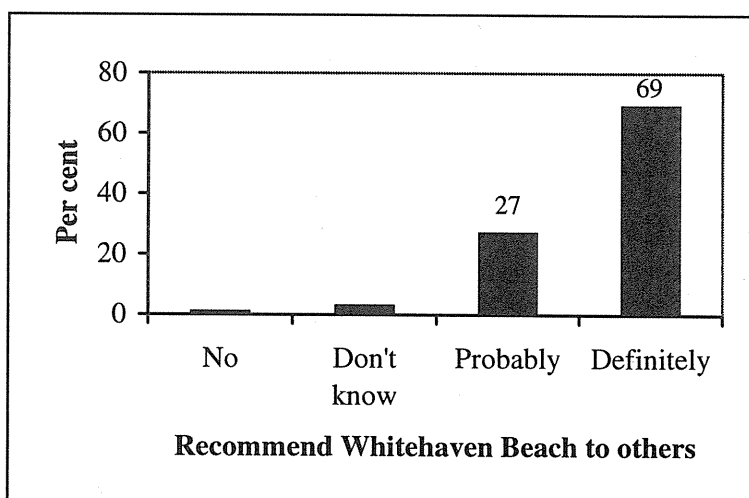


Figure 16. Would you recommend Whitehaven Beach to others?

Further analysis showed significant differences in the levels of satisfaction among the four different visitor groups (table 35). The socially active naturalists were most likely to be satisfied with all aspects of their trip and the services provided. Notably, they were very satisfied with value for money (81%), staff friendliness and knowledge (95% and 91% respectively), and the range of activities provided whilst at Whitehaven Beach (81%). Eighty-eight per cent of this group said they would definitely recommend the trip to others. In comparison to the other three groups, the passivists were the least satisfied with the services provided. Although 76% were very satisfied with the friendliness of the staff, a significantly lower proportion were satisfied with the amount and quality of education (12%), value for money (38%), activities provided (42%) and knowledge of the staff (54%). This group was less certain about recommending the trip to others, with half indicating that they probably would (49%). The nature escapists were significantly less satisfied with the amount and quality of education provided by the operator (46% and 38% not satisfied respectively). Despite some clear dissatisfaction with certain services, 73% of this group still said that they would definitely recommend a Whitehaven Beach trip to their friends and family.

Table 35. A comparison of trip satisfactions based on benefit cluster membership

Trip Satisfactions	Visitor Clusters*				test statistic	p value
	Passivists	Socially Active Naturalists	Relaxed Sightseers	Nature Escapists		
<u>Value for money</u>						
Not satisfied	48.0	15.7	19.1	31.3	$X^2 = 37.78$	< 0.000
No opinion	14.0	3.6	25.0	11.9		
Very satisfied	38.0	80.7	55.9	56.7		
<u>Staff friendliness</u>						
Not satisfied	16.0	2.3	2.9	2.9	$X^2 = 18.58$	< 0.005
No opinion	8.0	2.3	2.9	5.8		
Very satisfied	76.0	95.3	94.1	91.3		
<u>Staff knowledge</u>						
Not satisfied	14.0	4.7	4.4	1.4	$X^2 = 32.44$	< 0.000
No opinion	32.0	3.5	13.2	18.8		
Very satisfied	54.0	91.8	82.4	79.7		
<u>Amount of education</u>						
Not satisfied	36.0	14.1	18.8	40.6	$X^2 = 55.75$	< 0.000
No opinion	52.0	17.6	36.2	34.8		
Very satisfied	12.0	68.2	44.9	24.6		
<u>Quality of education</u>						
Not satisfied	28.6	16.5	23.2	37.7	$X^2 = 49.94$	< 0.000
No opinion	59.2	17.6	36.2	36.2		
Very satisfied	12.2	65.9	40.6	26.1		
<u>Range of activities provided</u>						
Not satisfied	34.0	7.0	17.4	18.8	$X^2 = 26.98$	< .0000
No opinion	24.0	11.6	21.7	26.1		
Very satisfied	42.0	81.4	60.9	55.1		
<u>Recommend trip to others</u>						
No	3.8	-	-	1.0	$X^2 = 66.35$	< 0.000
Don't know	7.7	0.7	2.3	1.9		
Probably	48.7	11.0	29.5	24.3		
Definitely	39.7	88.3	68.2	72.8		

*Satisfaction Ratings where Not satisfied = Not at all satisfied & Somewhat Satisfied; No Opinion = No Opinion; Very Satisfied = Very Satisfied & Extremely Satisfied.

4.10.3 Future Visitation to the Whitsundays region

Respondents were asked whether they intended to revisit the Whitsundays region in the future. Thirteen per cent said they had no intention to revisit, 45% indicated that they didn't know and 42% said yes they did intend to return to the region. When asked where they would take their next trip 34% reported that they would like to travel around the Whitsunday Islands, 22% were interested in the outer reef, 17% said they would like to see Hamilton Island and 8% indicated that they wanted to revisit Whitehaven Beach (see table 36). See appendix 15 for a list of destinations respondents would like to visit in the future.

The next question asked visitors about the type of trip they would like to take in the future. The main responses given are displayed in table 37. Thirty-five per cent of respondents said they

wanted to travel to their next Whitsundays destination on yacht or a sailing boat, 19% simply reported that they would take a boat trip in general, eight per cent wanted to travel to their chosen destination by seaplane or helicopter and seven per cent mentioned a trip on a commercial tourist boat (refer to appendix 16 for more details).

Table 36. Future holiday destination in the Whitsundays region

Future holiday destination	Frequency	Per cent
Whitsunday islands	57	34
Outer reef	37	22
Hamilton Island	28	17
Whitehaven Beach	14	8

Table 37. Type of trip visitors would like to take on a future holiday to the Whitsundays region

Type of trip	Frequency	Per cent
Yacht	46	35
Boat in general	25	19
Relaxing holiday	13	10
Helicopter or plane	10	8
Commercial tourist boat	9	7

5.0 DISCUSSION

5.1 Visitors' Experiences of Whitehaven Beach

One of the primary objectives of this investigation was to determine the types and range of experiences had by visitors to Whitehaven Beach. The purpose of assessing benefits received is to provide an insight into the type and extent of experiential preferences of visitors. Findings clearly reflect that the natural environment and scenic qualities of Whitehaven Beach were attributes that visitors received most enjoyment from. Psychological and physiological benefits relating to rest, relaxation and escape were also seen as being well provided. Conversely, Whitehaven Beach was not evaluated highly as a physically or socially active place. Comparisons of benefits received from Whitehaven Beach appear to be very similar to the experiences provided to recreational participants of other studies undertaken in both land and water-based environments. As with previous investigations, results showed that the most salient experience was related to the 'natural setting' (Scherl et al. 1997; Shafer et al. 1998). Following this and almost without exception, past research in terrestrial areas (e.g. forests, lakes, mountains and rivers) has shown that benefits relating to relaxation and escape have been next in importance behind experiencing the environment (Brown & Hass 1980; Manfredo et al. 1983 in Shafer et al. 1998).

Patterns of experiential preferences among the respondents of this study were not unlike those found in other investigations of marine visitors to the Great Barrier Reef. In a recent Australian wide study, three important components tourists and visitors expected to experience when visiting the Great Barrier Reef were: the scenic beauty of the islands and the beaches, a natural, unspoilt environment and to see a variety of fish and coral (AGB McNair 1995). Of direct comparison to the current findings is Gooch's (1991) study of visitor experiences in the Whitsundays. Gooch (1991) noted that visitors to Whitehaven Beach attributed most of their experiences to the natural environment, scenery, peacefulness/tranquillity and mind clearing benefits received. In a study on the Lady Musgrave Island and reef by Scherl et al. (1997) findings revealed that visitors most positive evaluations were related to the physical environment, enjoyment of nature, reef and island ecosystems. Comparatively, Shafer et al. (1998) discovered that reef visitors received most of their benefits from experiencing nature and learning about it, followed by rest, relaxation and escape. In summary an overview of findings from reef and island sites show that the strongest experiential outcomes appear to relate to the perceived quality of the natural environment and subsequent psychological benefits received. According to Shafer et al. (1998) the fact that visitors to the Great Barrier Reef are provided with benefits related to seeing, experiencing and escaping to a natural environment gives additional justification for the need to understand how the natural and social environments are providing such benefits.

Evaluations of recreational experiences at Whitehaven Beach appear to be strongly influenced by the geographical and natural characteristics of this particular setting. Over 100 studies have found convincing evidence that natural environments are important in facilitating recovery from stress. As such, stress reduction has often emerged as one of the key perceived benefits of a wilderness experience (Knopf 1983; Ulrich et al. 1991). These stress related benefits of rest, relaxation and escape were also mimicked in the current study. Assessment of the aesthetic dimension of landscape has been found to be closely related to other psychological dimensions. For example, studies have found that landscape determined to be scenically beautiful elicits positive ratings of tranquillity, freedom and solitude (Daniel 1984; Ulrich 1977; Ulrich et al. 1991). Whitehaven Beach is a site that is perceived by visitors to be relatively free from stressful conditions, providing opportunities for nature experiences as well as scenic escape. It may be suggested that Whitehaven Beach is not only important as a natural resource area, but socially it also has a significant restorative function.

Experiences and Expectations

Understanding what people expect from Whitehaven Beach and then examining what experiences were received from their visit, gives an indication of how satisfied people were with the opportunities that were provided on-site. Previous research has indicated that experiencing a natural environment and participating in nature-based environmental activities were the most favoured types of expectations possessed by recreationalists. Likewise, findings of Whitehaven Beach showed that the most sought-after experiences related to participating in water-based activities such as swimming and snorkelling, enjoying the sea and sand, relaxing and sunbathing. The opportunity for visitors to participate in these activities complemented their expectations. Gooch (1991) also noted that swimming, beach walks and relaxation were at the top of people's list of most enjoyable experiences whilst visiting Whitehaven Beach.

The primary aim of nature-based tourism and recreation is to provide the right types of experiences and activities. The activities offered and those participated in can have a significant influence in the benefits received and overall satisfaction of an area. Interestingly, findings showed that people who were more likely to go for beach walks gained greater experiences from the beauty of Whitehaven Beach ($X^2 = 8.41$, $p < 0.05$), those who sunbathed rated rest and relaxation higher ($X^2 = 31.60$, $p < 0.001$), and visitors who snorkelled received greater benefits from experiencing something new and different ($X^2 = 19.53$, $p < 0.05$). This information implies that the activities offered and those participated in may have given visitors a fuller experience of Whitehaven Beach. For managers and tour operators these findings are positive, for they imply that Whitehaven Beach is currently providing the right types of opportunities to satisfy visitors experiential needs.

Visitor Types

Visitors were classified into four groups, identified to reflect the types of people benefiting from similar recreational experiences. Clustering groups into similar types (e.g. relaxed sightseers, socially active naturalists) can assist in providing more satisfying recreational experiences and assist with the application and assessment of the ROS. More generally this information makes it possible for managers to make refined descriptive assertions about the types of visitors that Whitehaven Beach attracts and also helps to understand the reasons behind why people choose to travel to this particular destination.

Findings showed that Whitehaven Beach is a destination that attracts all age groups and is just as popular with Australian holidayers as it is with international visitors. Results suggest that there are different types of visitors travelling to Whitehaven Beach who select different types of tour operators for their trip. For example, large operators tended to attract couples and families from an older age bracket, whilst smaller more personalised boats were more likely to carry younger single travellers, or groups of friends. Although respondents travelled to much the same setting and participated in relatively similar types of activities, generally they received different levels of benefits. From a management standpoint these 'benefit clusters' provide valuable information from which to assess changes in visitor types and their experiential preferences.

5.2 The Values Ascribed to Whitehaven Beach

Values are central in people's belief systems, they influence judgements, identification of needs, discriminates among competing demands and are implicitly expressed in environmental dispositions (Stankey 1982). Understanding reasons for valuing particular sites in the GBRMP is important in making decisions about how to designate and manage sites. According to Shafer et al. (1998) the meanings that people assign to places in the environment are often related to how strongly they feel about potential changes to it. The strongest values associated with Whitehaven Bay related to its natural and ecological processes, conservation, recreation and educational opportunities. Economic opportunities and the spiritual meaning of the area were of least importance to respondents. Previous research has found that visitors ascribed similar

values to other places on the Great Barrier Reef (Green et al. 1999; Shafer et al. 1998).

Shafer and colleagues (1998) noted that reef sites were considered very valuable for the conservation, natural processes and educational opportunities offered there. In support of the current findings, economic opportunities and spiritual meaning only held slight importance to reef visitors. These authors suggested that the low value placed on economic opportunities could be confounded by its interpretation as an issue related to other forms of exploitation. In the case of Whitehaven Beach this exploitation could be in the form of commercial use, development or degradation of the natural environment. These are the issues visitors and local residents said would impact upon their enjoyment of future visits to Whitehaven Beach. A low level of spiritual importance was also noted in Shafer et al.'s (1998) reef research. Historically there has been a long-standing spiritual connection between Aboriginal and Torres Strait Islander peoples and sites on the Great Barrier Reef. The fact that Australian respondents in this study rated spiritual values lower could simply mean that they don't consider this spiritual relationship to be of significance, they are not aware of it, or that people are interpreting the meaning of 'spirituality' differently. Interpretation of spiritual values in relation to sites on the Great Barrier Reef clearly needs to be redefined through continued research.

The importance of values associated with the natural and conservation aspects of Whitehaven Beach were also reflected in people's perceptions and post-visitation images. Used as a management tool, these significant values will help to legitimise the meanings that users assign to Whitehaven Bay. These values are also important indicators for managers in their planning process. Human valuation of sites such as that of Whitehaven Bay can be applied to other places on the Great Barrier Reef that may have similar attributes, both socially and environmentally. These social values in turn can inform decision-makers about Marine Park zoning designations. The more understanding that management obtains about the meanings of values in the GBRMP the greater the probability of designing successful strategies to implement change (or lack of it, as in the case of Whitehaven Beach), that will be agreeable to users and the public at large.

5.3 Conditions Influencing Visitors Experiences

Visitors' reactions and responses to more specific conditions showed that the natural environment was more influential in shaping people's enjoyment of Whitehaven Beach, when compared to perceptions of social conditions such as visitation by boats, aircraft and other people. Throughout this research, results point to the importance of Whitehaven Beach's natural environment as a factor influencing experiences. Shafer et al.'s (1998) investigation of reef sites found similar findings.

Weather had no significant relationship to the benefits received by visitors or their trip satisfaction, yet was important in their expectations and was something that both added to and detracted from their enjoyment. Gooch (1991) found that bad weather was mentioned as a factor that detracted from visitors' enjoyment of Whitehaven Beach. In Shafer et al.'s (1998) study, large numbers of reef visitors indicated that sea conditions and wind had a negative influence on their experiences. Weather conditions can play an important part in the satisfactions of recreational and tourism experiences, particularly with people who have had little experience with ocean travel. Many tourist passengers travelling to and from Whitehaven Beach during the surveying phase experienced rough sea conditions and seasickness. It is surprising that this was not reflected more so in visitors' satisfaction ratings of their Whitehaven Beach visit. Further research should continue to assess weather conditions as a factor when assessing visitors' experiences and perception of a site.

Another significant condition worth mentioning was visitors' sightings of dolphins, turtles and sand goannas. Encounters with wildlife in terrestrial environments is something that has been found to enhance people's perceptions of an area, and according to Roggenbuck et al. (1993) is "critical to wilderness users' experiences" (p. 191). Fish, and more specifically large fish, were scored as one of the most positive influences in reef visitors' experiences (Shafer et al. 1998).

Shafer et al. (1998) suggested that seeing species of fish or marine life might heighten an individual's experience just as they have been shown to do in land-based wilderness environments.

Other People and Visual Intrusions

The numbers and types of people encountered on-site and on tour operators travelling to and from Whitehaven Beach, compromise elements of the social condition. An assessment of optimum use levels were sought by examining people's perception of other visitors using the setting and how the quality of their experience was affected by the presence of others and their activities. Findings showed that other people did not affect many visitors to Whitehaven Beach. Overall only 12% indicated that they felt there were too many people, and an even lower percentage said that other visitors had a negative influence on their enjoyment. Previous research by Gooch (1991) asked people at Whitehaven about how they felt about others and their activities on the beach. Twenty-eight per cent reported that the number of other visitors they saw was more than what was expected and 21% said there were less. Eighty per cent indicated that other visitors did not interfere with their experiences and activities whilst visiting the beach. Gooch's (1991) study was undertaken in the peak tourist season of June.

Based on findings from the crowding literature, an inverse relationship is said to exist between visitor satisfaction and the number of people encountered (Stankey 1973). This was not supported in the analyses from this investigation. Instead no significant relationships were found between the number of people on the beach and the influence they had on recreational experiences.

Notably, local members of interest groups did have an issue with regards to the amount of use, current and future, of Whitehaven Beach. Some of these local residents perceived there to be an increase in use of Whitehaven Beach, and concern was expressed about the future growth in visitor numbers, boats, aircraft and consequential environmental effects. Shafer et al. (1998) suggests that even the small differences in visitor perceptions of conditions between past visitors and first time visitors are worth noting. In this case, it is interesting to find that a slightly higher percentage of repeat visitors rated conditions of crowding higher than first time visitors. This issue warrants future monitoring, for the decline of a destination has been shown to correspond with the exceedence of tourism and substantial changes in the surrounding natural and social environment (Martin & Uysal 1990).

Aircraft

The assessment of aircraft on visitors' experiences whilst at Whitehaven Beach is a proactive response to what could be considered a potential threat to visitors' use and amenity in the future. If American studies on acceptable levels of aircraft activity have anything to show, it clearly reflects a 'patch-up' approach to what has become a real concern to wilderness users, natural resource managers and more generally the public at large. Pleasingly, findings suggest that visitors and users of Whitehaven Beach are not being negatively affected by aircraft activity at this season and level of use. In many respects results imply that aircraft overflights and landings are within users limits of acceptability. These findings should still be interpreted with some caution, because visitors were surveyed during the low aircraft season. As such, the number of aircraft overflights and events were not representative of what they can be in high peak season.

What is interesting, is that many visitors said that they didn't notice any aircraft flying overhead or land on the beach during their stay. Actual on-site observations of aircraft activity indicate otherwise. Similarly, Tarrant et al. (1995) found that recreationists reported hearing and seeing less aircraft than there actually were. Future surveys should question people about actual numbers seen and heard to support these suggestions. It should be noted that although very few aircraft overflights/events occurred during the data collection phase, Tarrant et al. (1995) stated that for many visitors the presence of only a single aircraft incident may be sufficiently memorable to affect a wilderness trip experience.

One of the primary reasons people visited Whitehaven Beach was to experience quiet, peacefulness, solitude and escape routine. Noise has been found to relate to undesirable sounds of urbanisation, and to have strong effects on solitude and tranquillity (Mace et al. 1999). When sounds are deemed inappropriate for a given area, noise will then be considered annoying and most likely detract from people's experiences and enjoyment of nature. Hamilton (1999) found that watercraft decibel levels at Whitehaven Beach were much lower than those obtained for aircraft, suggesting that aircraft have a greater sound impact. The negative influence of noise from aircraft activity and visitation by watercraft was not evident in the responses of visitors to Whitehaven Beach. Hamilton's (1999) data also showed that the least impacted site was Setting 2 in terms of frequency of aircraft events, whilst the most impacted settings were the Moderate Use (Setting 3) and Natural zones (Setting 5). Setting 2 was the most visited destination by respondents in this investigation. Findings however, showed no differences in perceptions of aircraft activity and the setting visited.

To summarise the visual intrusion of aircraft and vessels from the naturalness of the Whitehaven Beach landscape was not an issue to visitors. Visitors were happy with what they saw and the noise levels they heard from boating and aircraft activity. There was no significant indication that they preferred to see or hear less craft during their visit to Whitehaven Beach. The activities of aircraft on visitors' use and amenity at Whitehaven Beach, cannot be compared to the impact aircraft are having on recreational wilderness areas in the United States. For example, findings have shown that there is not a single location recorded in the Grand Canyon National Park that is totally free of aircraft noise (Horonjeff et al. 1993). Aircraft noise is audible 79% of the time, with as many as 43 separate aircraft noise events occurring within every 20-minute interval. The Grand Canyon situation suggests a need for a proactive approach to understanding how increased flights relate to noise generated. Uncontrolled increases may lead to unacceptable situations.

5.4 Images of Whitehaven Beach

Satisfaction with a visited destination depends not only upon the configuration of ideal images held before visitation, but also upon experiences received whilst at the destination which influence the actual images (Ross 1992). The post-visitation images that visitors and local members of interest groups had of Whitehaven Beach reflected that of a scenic, beautiful, quiet and relaxing environment. Similar words were used to describe people's thoughts of Whitehaven Beach in Gooch's (1991) study. Green et al. (1999) found that people described the Great Barrier Reef in a similar fashion, i.e. beautiful, pristine, untouched, and amazing. Many of these images are consistent with the World Heritage status and values of the Great Barrier Reef.

Images portrayed of Whitehaven Beach by visitors and local users were a reflection of their beliefs and impressions. Hoffman and Low (1978) found that the most important variable in any decision to return to a destination was the visitors image (in Ross 1992). If this is correct, then the images that visitors hold of Whitehaven Beach is likely to be reflected in their return visit to this area. For 90% of the sample it was their first visit to Whitehaven Beach. It is likely that for these people, their initial impressions of Whitehaven Beach were induced by a range of images presented by the tourism industry in brochures. Fenton et al. (1998) suggest that media descriptions of place are often simplified generalisations that present idealised images. Tourists who have high levels of exposure to media images may be disappointed in the failure of reality to match these preconceived images (Vanclay 1995). This was not necessarily reflected in the perceptions and evaluations visitors held of Whitehaven Beach. Findings suggest that images of Whitehaven Beach met visitors' expectations.

The images that people take away from their trip to Whitehaven Beach are a reflection of their core experiences and perceptions of this destination. Visitors' expectations, experiences, values and images are indicators of the meaning of Whitehaven Beach. This meaning of place has implications for people's reaction to change and the environmental plans, which directs why and how change will occur (Shafer et al. 1998). In this context, findings show that Whitehaven

Beach has and sustains a unique image. Maintaining this image by providing the right opportunities for users whilst maintaining the aesthetic beauty of this natural environment will continue to be a challenge for future managers and planners of the GBRMP.

5.5 Implications for Management

The primary implications for management are simple. If managers wish to provide a sustainable resource that meets users' expectations, the biophysical and social environment of Whitehaven Beach must be well cared for (Shafer et al. 1998). It was evident from findings that post-visitation images and experiences related specifically to the condition and quality of the natural Whitehaven Beach environment and the psychological/physiological experiences subsequently provided. What this study also found was that visitors differed in the types of experiences 'benefit packages' they received, yet perceived different conditions in similar ways. These experiences and evaluations indicate that there are a spectrum of ways to experience Whitehaven Beach. This type of information assists planners in developing an experience based approach to designating use (types and amounts) and selecting indicators in a LAC process.

The current zoning plan provisions of Whitehaven Beach that designates levels of use, types of use, level of development and methods of access can be further defined to provide a range of opportunities to suit different experiences sought by the visitor while helping to protect the biophysical environment. An assessment of whether users were receiving different amounts of benefits within the different settings along Whitehaven Beach could not be examined in this investigation due to low visitor numbers in Settings 3 and 4. However, findings showed that in terms of use levels, there is justification for maintaining these differences through spatial designations. Observations reflected that Setting 2 is being utilised as a high use area by tourist boat operators, and as such receives the greatest amount of visitation. Despite this high use, visitors' experiences were still very much influenced by the natural components of the Whitehaven Beach environment. At the other end of the spectrum is Hill Inlet (Natural setting); an area of high cultural and biological value. Current zoning plans help to protect these unique attributes of Hill Inlet whilst allowing people to experience solitude in a pristine environment. Natural tides also assist in making this Inlet a self-managed area. Planners should continue to acknowledge that these settings provide opportunities for a spectrum of experiences at Whitehaven Bay.

When examining the demand for recreational experiences in relation to Whitehaven Beach, this study has identified the most satisfying experiences for which management might provide opportunity. If managers know what outcomes people desire, then planners can attempt to meet those desires where it is appropriate to do so within other constraints (Brown & Haas 1980). Continued collection of information will provide planners and managers with a greater insight into the needs and preferences of visitors. In the meantime this baseline data can assist with the assessment and revision of appropriate levels, conditions and distribution of use. Zoning decisions of Whitehaven Bay should continue to accommodate varying ecological and social conditions (e.g. visitor characteristics, experiences, aircraft activity, amount of use, and quality of biophysical resources) that are specific to the area. Consistent with this approach, managers of Whitehaven Bay might set specific objectives in order to continue to provide opportunities for meeting desired outcomes, such as experiencing an undeveloped environment, escaping from normal routine, viewing outstanding scenery and so forth. At present visitors are achieving a satisfying recreational experience.

A challenge for management is to ensure that increased use and development does not devalue visitors' experiences at Whitehaven Beach in the future. Tour operators are presently working together to arrive at different times and anchor certain distances away from one another. Observations reflected that they are implementing their own strategies to reduce the impact of visitation by overcrowding. A ROS type situation currently exists 'de facto' among tour operators currently using Whitehaven Beach, with large and small operators using and choosing to visit different areas of a setting. Additionally, for managers it is important to ensure that the

remote qualities and scenic integrity of Whitehaven Beach is not inadvertently lost through development and an inappropriate installation of facilities. From concerns expressed by respondents, findings obviously recommend that no unsightly development be allowed on Whitehaven Beach.

It is hoped that some of these findings will be used to assist with further development of the Whitsundays Plans of Management and revision of settings at Whitehaven Bay.

5.6 Future Research and Monitoring

There has been a paucity of information about how different users and visitors perceive and experience the natural and social resources of Whitehaven Beach and other sites of interest in the Whitsunday Group. This study provides baseline data, for a certain season and level of use, from which to understand the types and range of visitors' experiences of Whitehaven Beach and the extent to which they were influenced by various conditions. A systematic investigation representative of the low and peak season is required to examine how changes in the physical and social environment may shape visitors' experiences and perceptions of Whitehaven Bay in the future. In conjunction, long-term monitoring should be continued to record the amounts and types of use at different settings throughout the year at Whitehaven Bay. This monitoring program has already commenced and is being undertaken by the Whitsunday Volunteers Inc. at Airlie Beach.

In the LAC process specific indicator conditions must be defined in order to select those that are feasible for use in the setting of standards for reliable monitoring. Contemporary approaches have abandoned attempts to measure limits to use and rely instead on such indicators to assess standards of social and environmental quality (Stankey et al. 1985; Shelby & Heberlein 1986; Graefe et al. 1984). This investigation has highlighted a number of experiential preferences and conditions that may be useful as indicators of social amenity for future monitoring. Aircraft activity, size and type of vessels, numbers and activities of other people are all indicators that may be useful in assessing visitors' levels of acceptance. The natural attributes of Whitehaven have also been shown to be something that people want to see and experience. The bottom line is that these environmental components relating to scenery, natural beauty, sand and water quality are all important indicators from which to monitor changes in social assessment of Whitehaven Beach.

One of the most prominent social indicators identified was the number of people on Whitehaven Beach. Findings show that the number of people encountered by visitors and locals whilst visiting Whitehaven Beach does matter to some, and is an issue that could be monitored in the future. Expanding research to measure the social carrying capacity of Whitehaven Beach can be continued through examining people's perceptions of others and how other people affected their quality of experience. It is possible that future studies may be able to quantify acceptable numbers of visitors to assist with the feasibility of the current zoning strategy for Whitehaven Beach. Further thought should also be given to monitoring how different settings are suited for different types and sizes of vessels and concentrations of people. The aim of further research should also be to assess within these settings different types of benefits received, and clarify what social and biophysical conditions may be more or less important to different users. Research of this type should be implemented at higher use levels than were possible for this study.

Further research should continue to monitor user numbers in association with an assessment of influence upon visitors use and amenity. Ultimately the challenge is to identify both social thresholds and implement management strategies that will prevent conflicts between use, amenity values and conservation. Another suggestion that should be given some attention, is the issue of displacement, particularly by local residents who may be changing their patterns of use due to an increase in visitor numbers. By surveying a range of stakeholders as well as day-trip visitors a greater coverage of perceived changes in the social and biophysical environment of

Whitehaven Bay may be achieved. Additional research should also assess whether a 'maturing process' is occurring in order to determine whether visitors are choosing smaller operators for their second/third trip. Information will assist with determining whether or not a type of trip is influential in providing visitors with certain experiences and satisfactions of their Whitehaven Beach visit.

The positive evaluations of aircraft and vessels at Whitehaven Beach by visitors in this study are encouraging, however, on-site monitoring should continue. Findings suggest that Whitehaven Beach is very acceptable in terms of typical impacts (noise, number of people, aircraft activity etc.) during the low use season. However we strongly recommend that further research be conducted during high use season (e.g. June/July, December) and in fair weather. Extended work could investigate the relationship between objective noise levels and users' perceptions of aircraft and vessel activity at the beach. Additionally aircraft assessment should question whether people are more tolerant of seeing rather than hearing aircraft. Future research should also include a multidimensional measure of visitor satisfaction in relation to aircraft activity. This suggestion is made because research continues to show that people take trips to satisfy many different preference states and experiences.

We feel that findings here can be useful in selecting specific indicators for a monitoring program at Whitehaven Beach. In order for management to meet objectives related to providing a quality natural environment at Whitehaven Beach, the quality of attribute conditions congruent with different experience and perceptual dimensions must continue to be considered. The survey instrument utilised in the current investigation can be further developed and used to monitor conditions associated with anthropogenic activity on Whitehaven Beach. In order to better understand users' needs and preferences, planners will need to continue to incorporate surveys and visitor data analysis in the planning process.

6.0 CONCLUSION

One of the primary concerns managers have with regards to increasing use in the Great Barrier Reef Marine Park, is the potential degradation of the natural and social environments of popular sites such as that of Whitehaven Beach. In this study we attempted to assess whether current levels and types of use (inclusive of aircraft and vessel activity) were having an influence upon visitors' use and amenity. Findings suggest that visitors of Whitehaven Beach are not being negatively affected by aircraft activity, visitation by watercraft or other people and their activities during the low use season. The amount of current use of Whitehaven Bay appears to be within visitors' limits of acceptability. Visitors perceived Whitehaven Beach to be a tranquil and quiet site, free from stressful conditions, which provided opportunity for nature experiences and scenic escape. Visitors differed in the types and range of experiences 'benefit packages' they received, yet perceived conditions in similar ways, thus indicating that there are a spectrum of ways to experience Whitehaven Bay. For planners and managers this type of information assists in the development of an experienced based approach to designating types and amounts of use.

Places such as that of Whitehaven Bay vary in what they offer and attract users who differ in what they seek. As reflected in this investigation, natural and social systems are very much interdependent. Managing for multiple use is greatly dependent upon how people think and feel about an environment. Users are the key to understanding these factors and enable planners to provide for an appropriate mix of experiential opportunities whilst protecting the natural values of Marine Park areas. As such, research must continue to monitor social amenity values of Whitehaven Beach in order to continue to ensure that unfettered growth in the tourism industry doesn't degrade the very resources on which it relies. In the meanwhile it appears that Whitehaven Beach is providing the right types of opportunities to satisfy visitors' experiential needs, and this is greatly attributed to the natural beauty and scenic qualities of this unique environment.

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APPENDIX 1. VISITOR SURVEY 1

YOUR EXPERIENCES AT WHITEHAVEN BEACH

You can help the Great Barrier Reef Marine Park Authority and the Queensland Parks and Wildlife Service to manage, protect and conserve the Great Barrier Reef by spending 5–10 minutes of your time completing this survey. Your help is very important to us. All your answers will be confidential and your participation is voluntary.

Section 1: Visiting the Whitsundays region (Previous visits)

Please tick the space that best represents your answer.

1. Have you been to the Whitsundays region on a previous holiday or visit?
 - a. No If no, please go to Section 2 below.
 Yes → If yes, about how many times have you visited the Whitsundays (reef or island area) before today? _____ Times
 - b. When was your last trip to the Whitsundays region? _____
2. Have you ever visited Whitehaven Beach before today?
 - a. No If no, please go to Section 2.
 Yes → If yes, about how many times have you visited Whitehaven Beach before today? _____ Times
 - b. When was your last trip to Whitehaven Beach? _____
 - c. Compared to your last trip, have you chosen today to travel to Whitehaven Beach with a different type of boat operator?
 No
 Yes → If yes, why did you choose today to travel with a different operator?

Section 2: Today's Visit to Whitehaven Beach

Please answer questions 3 and 4 by **ticking yes or no**. If you answer yes, please **provide a brief answer**.

3. Think about your trip today, were there things that stand out as adding to your enjoyment during the time you spent on Whitehaven Beach?
 No
 Yes → The thing that added most to my enjoyment was: _____

4. Were there things during your visit whilst on Whitehaven Beach today that stand out as detracting from your enjoyment?
 No
 Yes → The thing that detracted most from my enjoyment was: _____

5. What types of experiences did you expect to have whilst visiting Whitehaven Beach? _____

6. What three words/phrases would you use to describe the Whitehaven Beach setting you visited today?

Section 3: Values of Whitehaven Beach

7. Places on the Great Barrier Reef may be important for many reasons. **Thinking about Whitehaven Beach, how important is each of the following to the value of this place?** Please circle the number that best represents your feelings.

<i>I feel Whitehaven Beach is valuable for:</i>	No value	Little value	No opinion	Some value	Extreme value
Recreational opportunities	1	2	3	4	5
Natural/ecological processes	1	2	3	4	5
Scientific research	1	2	3	4	5
Cultural heritage	1	2	3	4	5
Economic opportunities	1	2	3	4	5
Spiritual values	1	2	3	4	5
Conservation values	1	2	3	4	5
Educational opportunities	1	2	3	4	5
Historical meaning	1	2	3	4	5

Section 4: Experiencing Whitehaven Beach

8. Some things that visitors may experience from today's trip are listed below. Please indicate **how much your visit to Whitehaven Beach provided each of these for you by circling a number for each item.**

<i>This trip allowed me to:</i>	Not at all	Slightly	Some	High	Very High
Have some excitement	1	2	3	4	5
See the beauty of Whitehaven Beach	1	2	3	4	5
Be close to friends or family	1	2	3	4	5
Meet new people	1	2	3	4	5
Experience an undeveloped environment	1	2	3	4	5
To rest and relax	1	2	3	4	5
Be with others who enjoy the things that I enjoy	1	2	3	4	5
Experience some solitude	1	2	3	4	5
Be in a natural place	1	2	3	4	5
Escape from normal routine	1	2	3	4	5
Learn about the Great Barrier Reef	1	2	3	4	5
Experience something new and different	1	2	3	4	5
Be physically active	1	2	3	4	5
Go to a place my friends haven't been	1	2	3	4	5
View outstanding scenery	1	2	3	4	5
Have fun, be entertained	1	2	3	4	5

9. Thinking about your visit to Whitehaven Beach today, what could be improved? _____

10. Please **tick the activities** that you participated in whilst on Whitehaven Beach today, and estimate the percentage (%) of time engaged in this activity during your visit. **Please ensure the percentage of time spent on activities whilst at Whitehaven Beach adds to 100%.**

Activity	Participated	Percentage of time (%)
Swimming	_____	_____
Snorkelling	_____	_____
Beach walks	_____	_____
Bush/nature walks	_____	_____
Wildlife/bird watching	_____	_____
Relax/Sunbathing	_____	_____
Fishing	_____	_____
Taking photos	_____	_____
Beach games – please name	_____	_____
Others – please list	_____	_____
		100 %

11. Please rate each of the following conditions by **circling** one of the numbers provided.

I felt that whilst at Whitehaven Beach:

<i>The number of visits by:</i>	Too few	About right	Too many	Didn't matter to me
Aircraft (helicopters, seaplanes)	1	2	3	4
Large motorised boats (15–35 metres)	1	2	3	4
Medium motorised boats (< 15 metres)	1	2	3	4
Small motorised boats (< 6 metres)	1	2	3	4
Yachts and other sailing boats	1	2	3	4
Other people	1	2	3	4

<i>The distance away from:</i>	Too far	About right	Too close	Didn't matter to me
Aircraft (helicopters, seaplanes)	1	2	3	4
Large motorised boats (15–35 metres)	1	2	3	4
Medium motorised boats (< 15 metres)	1	2	3	4
Small motorised boats (< 6 metres)	1	2	3	4
Yachts and other sailing boats	1	2	3	4
Other people	1	2	3	4

<i>The noise from:</i>	Too noisy	About right	Too quiet	Didn't matter to me
Aircraft (helicopters, seaplanes)	1	2	3	4
Large motorised boats (15–35 metres)	1	2	3	4
Medium motorised boats (< 15 metres)	1	2	3	4
Small motorised boats (< 6 metres)	1	2	3	4
Other people	1	2	3	4

12. Did any of the items listed above (e.g. aircraft/boats) have **an influence on your enjoyment** in either a positive or negative way, whilst on Whitehaven Beach today? (Please tick)

No

Yes → If yes, briefly describe what influenced your enjoyment and how: _____

Section 5: Rating Your Whitehaven Beach Visit

13. How would you rate your trip to Whitehaven Beach today? (Please circle)

Very Poor 1 2 3 4 5 6 7 8 9 10 Excellent

14. Would you recommend a trip to Whitehaven Beach to friends/family? (Please tick)
 No Don't know Probably Definitely
15. Could you please tell us **how satisfied** you were with the following features of your visit?
Circle the number that best describes how you feel.

<i>How satisfied were you with:</i>	Not at all satisfied	Somewhat satisfied	No opinion	Very satisfied	Extremely satisfied
Value for money	1	2	3	4	5
Staff friendliness	1	2	3	4	5
Staff knowledge	1	2	3	4	5
Amount of education/information available	1	2	3	4	5
Quality of education/information provided	1	2	3	4	5
Range of activities provided	1	2	3	4	5

16. Do you intend to go to out to the Whitsunday reef/islands on a future holiday in this region?
(Please tick)
 No
 Don't know
 Yes → Where would you like to take your trip? _____
What type of trip would you take? _____

Section 6: General Characteristics

17. What type of group are you travelling with today (tick all that apply)
- Self
 - With partner or spouse only
 - With family
 - With friends
 - Organised group or club
 - Business associates/colleagues
- Other, please specify _____
18. Including you, how many people are in the group(s) that you ticked above? _____
19. Are you: Female Male
20. In what year were you born? _____
21. What is the highest level of education that you have completed? (Please tick)
 Primary Secondary Some University or technical University or technical degree
22. Which of the following best describes you? (Please tick)
- A local resident
 - An Australian citizen → What state are you from? _____
 - An international visitor to Australia → What country are you a citizen? _____

THANK YOU FOR YOUR COOPERATION

APPENDIX 2. VISITOR SURVEY 2

YOUR EXPERIENCES AT WHITEHAVEN BEACH

You can help the Great Barrier Reef Marine Park Authority and the Queensland Parks and Wildlife Service to manage, protect and conserve the Great Barrier Reef by spending 5 minutes of your time completing this survey. Your help is very important to us. All your answers will be confidential and your participation is voluntary.

Please answer the following questions **ticking yes or no**. If you answer yes, please **provide a brief answer**.

1. Have you been to the Whitsundays region on a previous holiday or visit?
 - a. No Yes → How many times? _____
2. Have you ever visited Whitehaven Beach before today?
 - a. No Yes → How many times? _____
 - b. When was your last trip to Whitehaven Beach? _____
3. During the time you spent on Whitehaven Beach, were there things that:
 - a. **Enhanced your enjoyment** that you would like to comment on?
 No Yes → If yes, please tell us what these things were: _____
 - b. **Detracted from your enjoyment** that you would like to comment on?
 No Yes → If yes, please tell us what these things were: _____
4. What types of experiences did you expect to have whilst visiting Whitehaven Beach? _____
5. Some things that visitors may experience from today's trip are listed below. Please indicate **how much your visit to Whitehaven Beach provided each of these for you by circling a number for each item**.

<i>This trip allowed me to:</i>	Not at all	Slightly	Some	High	Very High
Have some excitement	1	2	3	4	5
See the beauty of Whitehaven Beach	1	2	3	4	5
Be close to friends or family	1	2	3	4	5
Meet new people	1	2	3	4	5
Experience an undeveloped environment	1	2	3	4	5
To rest and relax	1	2	3	4	5
Be with others who enjoy the things that I enjoy	1	2	3	4	5
Experience some solitude	1	2	3	4	5
Be in a natural place	1	2	3	4	5
Escape from normal routine	1	2	3	4	5
Learn about the Great Barrier Reef	1	2	3	4	5
Experience something new and different	1	2	3	4	5
Be physically active	1	2	3	4	5
Go to a place my friends haven't been	1	2	3	4	5
View outstanding scenery	1	2	3	4	5
Have fun, be entertained	1	2	3	4	5

6. Thinking about your visit to Whitehaven Beach today, what could be improved? _____
7. What types of **activities** did you participate in whilst on Whitehaven Beach today? (e.g. swimming, snorkelling, beach walks, sunbathing/relaxing, photography, beach games, bushwalks)

8. Please rate each of the following conditions by circling one of the numbers provided.

I felt that whilst at Whitehaven Beach:

<i>The number of visits by:</i>	Too few	About right	Too many	Didn't matter to me
Aircraft (helicopters, seaplanes)	1	2	3	4
Large motorised boats (15-35 metres)	1	2	3	4
Medium motorised boats (< 15 metres)	1	2	3	4
Small motorised boats (< 6 metres)	1	2	3	4
Yachts and other sailing boats	1	2	3	4
Other people	1	2	3	4

<i>The distance away from:</i>	Too far	About right	Too close	Didn't matter to me
Aircraft (helicopters, seaplanes)	1	2	3	4
Large motorised boats (15-35 metres)	1	2	3	4
Medium motorised boats (< 15 metres)	1	2	3	4
Small motorised boats (< 6 metres)	1	2	3	4
Yachts and other sailing boats	1	2	3	4
Other people	1	2	3	4

<i>The noise from:</i>	Too noisy	About right	Too quiet	Didn't matter to me
Aircraft (helicopters, seaplanes)	1	2	3	4
Large motorised boats (15-35 metres)	1	2	3	4
Medium motorised boats (< 15 metres)	1	2	3	4
Small motorised boats (< 6 metres)	1	2	3	4
Other people	1	2	3	4

9. Did any of the items listed above (e.g. aircraft/boats/people) have **an influence on your enjoyment** in either a positive or negative way, whilst on Whitehaven Beach today? (Please tick)
 No Yes → If yes, briefly describe what influenced your enjoyment and how: _____
-
10. How would you rate your trip to Whitehaven Beach today? (Please circle)
 Very Poor 12.....345678910 Excellent
11. Would you recommend a trip to Whitehaven Beach to friends/family? (Please tick)
 No Don't know Probably Definitely
12. Do you intend to go to out to the Whitsunday reef/islands on a future holiday in this region? (Please tick)
 No Don't know Yes → Where would you like to take your trip? _____
 What type of trip would you take? _____
13. What type of group are you travelling with today (tick all that apply)
 Self With friends
 With partner or spouse only Organised group or club
 With family Business associates/colleagues
 Other, please specify _____
14. Including you, how many people are in the group(s) that you ticked above? _____
15. Are you: Female Male
16. In what year were you born? _____
17. What is the highest level of education that you have completed? (Please tick)
 Primary Secondary Some University or technical University or technical degree
18. Which of the following best describes you? (Please tick)
 An Australian citizen → What state are you from? _____
 An international visitor to Australia → What country are you a citizen? _____

APPENDIX 3. CAPTAIN'S ANNOUNCEMENT

Today we have a group of researchers on board who are collecting information for the Great Barrier Reef Marine Park Authority. On the way today these researchers will approach you (on a voluntary basis) to complete a short survey about your visit to Whitehaven Beach. The information is very important and will be used to assist Marine Park Management to improve both the quality of experiences for visitors and conserve Whitehaven Beach for the future. Participation from you would be greatly appreciated and all answers will be confidential.

Notes: Observation Form

Setting Visited:

Refer to the map to establish which setting was visited. Settings reflect the zoning of Whitehaven Beach. The four settings range from: Setting 2 (High Use = Vessels < 35 metres and an unlimited number of people); Setting 3 (Moderate Use = Vessels < 35 metres and up to 40 people); Setting 4 (Natural = Vessels < 15 metres and up to 12 people); and Setting 5 (Protected area = restrictions on boats and people).

Number of Vessels/People Observed in each Setting:

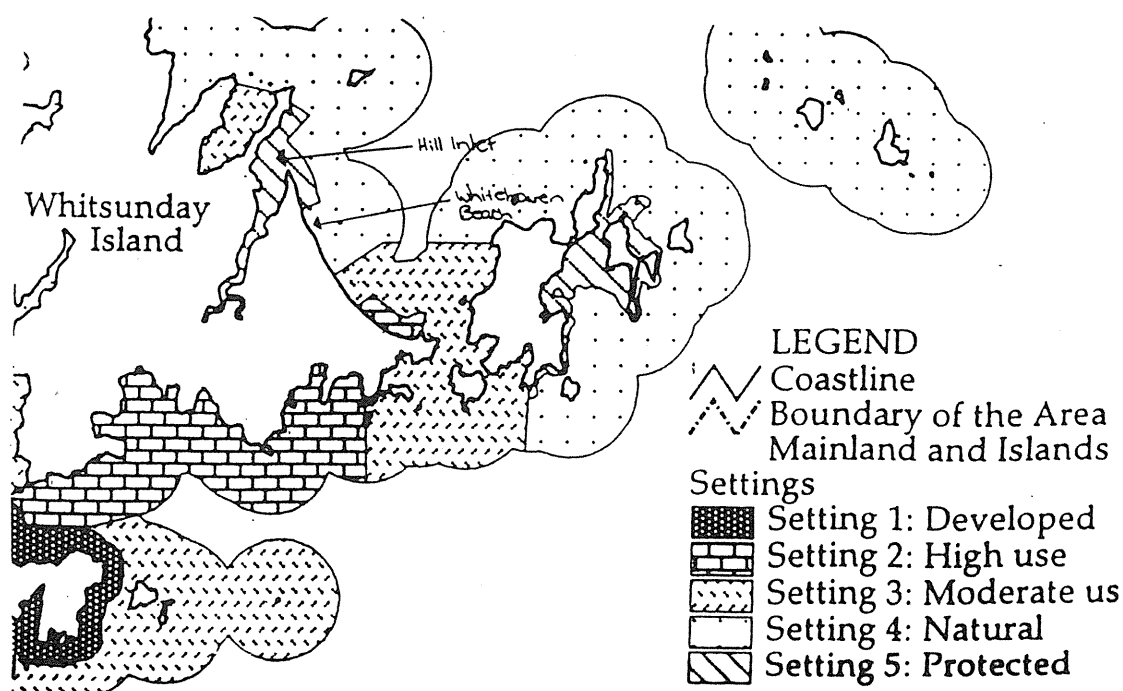
- Record the number of vessels (according to size) sighted within each of the 5 areas of interest whilst on Whitehaven Beach.
- It may not be possible to see boats/aircraft landings or the number of people in some settings along the beach because of distance. If it is impossible to make these observations record by marking a dash '—' which means 'not possible to make observations'. If there are no boats in a setting, record this by a '0' which means 'no vessels/ people'.
- Record the average number of people in each of the five areas. Obtain a spread of counts during your visit (3 counts), and average the number of people for each setting where possible.
- Record any interesting or unusual activity in the spaces provided under the settings in the Observation Table, or in the space provided for comments (e.g. The arrival of any large boat, jet ski activity, any illegal activity etc.).

Aircraft Activity:

- Record the number of fly-overs (not landings) by helicopters / seaplanes that occurred in your area. If there were no fly-overs in your setting record a '0' which means 'No Fly-overs'.
- If possible record the number of Aircraft events (Take-off and Landings) which occurred during your visit to Whitehaven Beach. If difficult to observe due to distance please record a dash '—' which means 'not possible to make observations'. If no landings mark a '0' = 'no landings'.

Comments: Use space at bottom of observation sheet to note any additional observations or general comments. (For example: If most boats left before your vessel on the day of your visit).

MAP 1. WHITEHAVEN BEACH SETTINGS



APPENDIX 5. INTEREST GROUP INFORMATION LETTER AND SURVEY

Whitehaven Beach Investigation

March 22, 1999

Dear _____

The Great Barrier Reef Marine Park Authority and the Queensland Parks and Wildlife Service are currently reviewing aspects of the Whitsundays Plan of Management. As consultants, Scott Shafer and I have been contracted to undertake the Whitehaven Beach Visitor Investigation. An important component of this research is to contact local interest groups, tourist operators and residents about your views regarding the use and management of Whitehaven Bay (which includes Whitehaven Beach and Hill Inlet). Information gathered will aim to provide management agencies with a clearer understanding of local attitudes and values in relation to Whitehaven Bay, and will be used to assist with developing an information database from which effective planning decisions can be made.

Attached is an Information Sheet about the Whitehaven Beach Investigation, and a short survey entitled 'Your Perceptions of Whitehaven Beach'. We would appreciate it if you could take the time to complete the survey and return it in the stamped addressed envelope by 9 April. Your name is not required, and all answers will be confidential. Follow-up meetings to discuss key issues raised in the survey responses can be arranged by phoning either myself on 07 4948 0981 or Meredith Hall on 07 4946 7022. Your participation is very important and greatly valued.

Yours sincerely

Jayne Ormsby
Social Science Consultant
INTEREST GROUP INFORMATION LETTER

WHITEHAVEN BEACH INVESTIGATION INFORMATION SHEET

An Introduction to the Study

The Whitsundays region and more specifically Whitehaven Beach is one of the most popular tourist destinations within the Great Barrier Reef Marine Park. The Great Barrier Reef Marine Park Authority is currently reviewing aspects of the Whitsundays Plan of Management (including Whitehaven Beach) and as a component of this review the Authority and the Queensland Parks and Wildlife Service are interested in collecting information from local interest groups, tourist operators and visitors. Jayne Ormsby and Scott Shafer are consultants who have been contracted to undertake the Whitehaven Beach investigation. An assessment of local values and perceptions, visitor usage patterns, experiences and motivations in relation to Whitehaven Beach is required and this information used to develop specific site planning for Whitehaven Beach. The information gathered will also provide management agencies with a clearer understanding of the range of opportunities and experiences that are sought by locals and visitors to Whitehaven Bay (which includes Whitehaven Beach). This investigation therefore will aim to develop an information database from which effective planning decisions can be made to both protect and provide for the existing diversity of opportunities at Whitehaven Beach.

Method of Collecting Data

Tourist operators and members of local interest groups have been asked to complete a short survey regarding their perceptions and views of Whitehaven Bay (including Whitehaven Beach and Hill Inlet). This survey will aim to give locals the opportunity to comment on the present condition and management of Whitehaven Beach. Follow-up meetings with each interest group/s will be arranged to discuss key issues raised in the survey responses.

During March and over the Easter break information will also be collected through surveying Whitehaven Beach visitors onboard vessels returning to Airlie Beach. The survey will take between 5–10 minutes. Assistance and cooperation from the tourism industry has been invaluable for the successful completion of this research.

Contact Details

Jayne Ormsby (Research Consultant)
Phone: 07 4948 0981 or Mobile 0412 655 310
E-mail: jayneo@internetnorth.com.au

INTEREST GROUP SURVEY

YOUR PERCEPTIONS OF WHITEHAVEN BEACH

You can help the Great Barrier Reef Marine Park Authority and the Queensland Parks and Wildlife Service to manage, protect and conserve the Great Barrier Reef by spending 5 minutes of your time completing this survey. Your opinions about Whitehaven Bay (including Whitehaven Beach, Hill Inlet and Tongue Point) are very important to us. All your answers will be confidential and your participation is voluntary. Although questions refer to Whitehaven Beach, we are equally interested in your views/experiences of Whitehaven Bay.

Section 1: Previous Visits to Whitehaven Beach

Please answer the following questions by **ticking yes or no**. If you answer yes, please **provide a brief answer**.

1. Did you visit Whitehaven Beach last year?
 - No If no, please go to Section 2 below.
 - Yes → If yes, about how many times did you visit Whitehaven Beach in 1998?
_____ Times
2. Had this number of visits to Whitehaven Beach in 1998 changed from previous years?
 - a. Increased Remained the same Decreased
 - b. If yes, why had your number of visits to Whitehaven Beach changed? _____

3. When was your last trip to Whitehaven Beach? _____
4. Please **tick the activities** that you would normally participate in whilst on Whitehaven Beach.

Activity	(Tick activities)
Swimming	<input type="checkbox"/>
Snorkelling	<input type="checkbox"/>
Beach walks	<input type="checkbox"/>
Bush/nature walks	<input type="checkbox"/>
Wildlife/bird watching	<input type="checkbox"/>
Relax/sunbathing	<input type="checkbox"/>
Fishing	<input type="checkbox"/>
Taking photos	<input type="checkbox"/>
Beach games—please name _____	
Others—please list _____	

5. From your previous visit/s to Whitehaven Beach, were there things that enhanced /detracted from your enjoyment that you would like to comment on?
 - No
 - Yes → If yes please tell us what these things were: _____

Section 2: Values of Whitehaven Beach

6. What three words/phrases would you use to describe Whitehaven Beach?

7. How important is Whitehaven Beach to you? (Please circle)
Extremely Important 1 2 3 4 5 Not at all Important

8. Places on the Great Barrier Reef may be important for many reasons. **Thinking about Whitehaven Beach, how important is each of the following to the value of this place?** Please circle the number that best represents your feelings.

<i>I feel Whitehaven Beach is valuable for:</i>	No value	Little value	No opinion	Some value	Extreme value
Recreational opportunities	1	2	3	4	5
Natural / ecological processes	1	2	3	4	5
Scientific research	1	2	3	4	5
Cultural heritage	1	2	3	4	5
Economic opportunities	1	2	3	4	5
Spiritual values	1	2	3	4	5
Conservation values	1	2	3	4	5
Educational opportunities	1	2	3	4	5
Historical meaning	1	2	3	4	5

Section 3: Perceptions of Whitehaven Beach

9. Have you noticed any significant differences / changes at Whitehaven Beach that you would like to comment on with regard to:

Levels and types of use: _____

Environmental conditions: _____

Other Comments: _____

10. What things might enhance / reduce your enjoyment of Whitehaven Beach in the future?

11. How much understanding do you have with regard to the Whitsundays Plan of Management? (Please circle)

No Understanding Some Understanding A Good Understanding

12. Do you agree with the current Whitsundays Plan of Management, specifically in relation to Whitehaven Bay (including Whitehaven Beach)?

Yes
 No → If no, what don't you agree with and why? _____

- 13.a How would you rate way that Whitehaven Beach is currently managed?

Very well managed 1.....2.....3.....4.....5..... Not at all well managed

13.b Why did you give this rating? _____

14. What improvements, if any, can be made to the way that Whitehaven Bay is managed?

Section 4: General Characteristics

15. Are you: Female Male

16. In what year were you born? _____

17. What is the highest level of education that you have completed? (Please tick)
 Primary Secondary Some University or technical University or technical degree

18. Do you consider yourself to be a local resident?
 No Yes → How long have you lived in this area? _____ Years

19. Do you have an interest group that you identify with? _____

THANK YOU FOR YOUR COOPERATION

If there are other things you would like to tell us please do so here:

APPENDIX 6. A SUMMARY OF RESULTS FROM THE INTEREST GROUP SURVEY

Interest Group Characteristics

- 16 male and 4 female members of local interest groups completed a mail survey (50% response rate)
- Average age was \bar{X} 53 (range 36 to 80 years of age)
- 10 local respondents had obtained a secondary level of education, 5 possessed some university / technical qualifications and 5 had completed a university degree
- All respondents considered themselves to be local residents; the average number of years these locals had resided in the Whitsundays region was \bar{X} 18.7 (range 2 to 68 years).
- Respondents were representatives of local interest groups which included: fishing (n = 3), tourism (n = 3), diving (n = 1), landcare (n = 1), boating club (n = 1), kayacker club (n = 1) and volunteers from the Queensland National Parks and Wildlife Service (n = 5).

Use and Activities undertaken in the Whitehaven Bay Area

- 15 of the 20 locals surveyed had visited Whitehaven Bay within the past year.
- Of these respondents, 10 had visited Whitehaven Beach between 2 and 6 times, 2 people indicated that they had travelled between 15 and 20 times, and one person had visited Whitehaven approximately 80 times.
- Residents were asked whether their visitation to Whitehaven Beach had changed from previous years. Eight respondents said that their usage of the area had remained the same, 3 reported that their trips had increased because they were new to the area, and 4 respondents indicated that their number of visits had decreased. Reasons for a decrease in use included: limited time available for recreation, the beach has become too crowded, and weather conditions had made it difficult to get out to Whitehaven Beach.
- The most popular activities undertaken by these local visitors to Whitehaven Beach included swimming (n = 14), beach walks (n = 13), relaxation and sunbathing (n = 5), taking photos (n = 5), birdwatching (n = 5) and fishing (n = 4).

Importance, Images and Values of Whitehaven Beach

- Whitehaven Beach was rated as 'extremely important' by the majority of local respondents (n = 15) (see figure 1).
- The most popular words used by local respondents to describe Whitehaven Beach were: spectacular / amazing; natural; beautiful; pristine; unique; pure white sand; crystal clear water; and a visual icon.
- Quiet, peaceful, unspoiled, and clean were also images locals had of Whitehaven Beach.
- Respondents felt that Whitehaven Beach was mostly valuable for: conservation (\bar{X} 4.60); recreational opportunities (\bar{X} 4.50); natural / ecological processes (\bar{X} 4.45); and educational opportunities (\bar{X} 4.05).
- Of least importance to respondents were the spiritual values (\bar{X} 2.85); historical meaning (\bar{X} 3.00); scientific research (\bar{X} 3.10); and cultural heritage (\bar{X} 3.10) of the Whitehaven Bay area.

Perceived Changes in Conditions at Whitehaven Beach

- Respondents were questioned about things that may have enhanced or detracted their enjoyment of Whitehaven Beach from previous visits. Things that detracted from locals enjoyment of Whitehaven included too many other people (n = 2), too many boats (n = 2); planes and helicopters were noisy (n = 1), sandflies (n = 2), jet skiers (n = 2) and the poor state of the toilets (n = 1).
- Having access to Hill Inlet (n = 1), walking up to the new lookout over Hill Inlet (n = 1) and the pristine environment and scenery (n = 1) were things that enhanced local users' enjoyment of Whitehaven Beach.
- Significant changes mentioned with regard to the levels and types of use included an increase in visitor numbers and recreational use (n = 7), and perceived crowding at one end of the beach (n = 2). Others included an increase in bareboats visiting Whitehaven, an increase in use of toilet facilities, increase in watersports, and camping which is no longer allowed at Whitehaven Beach.
- Some respondents said that there were no significant changes in the environmental condition of Whitehaven Beach (n = 8). A decrease in turtle breeding, concerns about moorings on seagrass beds and an increase in rubbish were mentioned by respondents' as observed changes to the environment at Whitehaven. Environmental impacts also noted included: an oil spill which left blobs of oil on the beach, a cyclone which wiped out she-oak trees at Hill Inlet 25 years ago; and the entrance to hill inlet which has doubled in size over the past 20 years.
- Things mentioned that would enhance locals enjoyment of Whitehaven Beach in the future included: no development (leave beach in its present state), allow camping, provision of shade, retained access to Hill Inlet and closure of Hill Inlet.
- Things that respondents said would detract from their enjoyment of Whitehaven Beach in the future included an increase in aircraft noise, large boats, people, development and rubbish.

Attitudes towards Current Management and Plans of Management for Whitehaven Beach

- According to local respondents 16 said they had a 'good understanding' of the Whitsundays Plan of Management, whilst six indicated that they had 'some understanding' of management plans.
- Nine people said they agreed with the current Whitsundays Plan of Management (in relation to Whitehaven Bay) and twelve disagreed with the management plans.
- Twelve people said that Whitehaven Beach is currently 'well managed', and five indicated that they felt that Whitehaven Beach was 'not managed well'.
- Reasons for poor management included: a lack of amenities at the southern end; too crowded at high-use end and visiting boats should be allowed to spread out, people should be able to have access to Hill Inlet; not enough research is undertaken on-site or on the underwater environment at Whitehaven Beach; more patrols are needed.
- Good management was perceived by respondents because there has been little change in the natural environment over the years; frequent visits are made to Whitehaven Beach by rangers; adequate monitoring of Whitehaven Beach is being undertaken. There were also suggestions that management are doing the best they can given their limited resources.
- Suggested improvements in relation to the current management of Whitehaven Beach included moorings (n = 4); better toilet facilities (n = 3); more rangers on-site (n = 2); access to Hill Inlet (n = 2) and allow people to spread out along beach (n = 2).

APPENDIX 7. EXPECTED EXPERIENCES FROM WHITEHAVEN BEACH

Experiences	Frequency	Per cent
To swim and go snorkelling	134	20.5
See beach and silica sand	122	18.7
Relax and sunbathe	107	16.4
See and feel the water	51	7.8
Experience nature and enjoy surroundings	46	7.0
Peacefulness and quiet	41	6.3
Enjoy good weather	36	5.5
Have fun	26	4.0
Views and scenery	26	4.0
Unspoiled, uncommercialised beach	20	3.1
See better coral and fish	18	2.8
See coral, fish, turtles	9	1.4
Tourist environment, commercialised	4	0.6
Shops and bars	3	0.5
Learn about reef and islands	3	0.5
No crowds	3	0.5
Bushwalking tracks	2	0.3
See new things	1	0.2
Action on beach	1	0.2
Scenic flight of Whitehaven Beach	1	0.2

APPENDIX 8. POST-VISITATION IMAGES OF WHITEHAVEN BEACH

Words used to describe Whitehaven Beach	Frequency	Per cent
Beautiful, pretty	103	12.1
Relaxing, calming	73	8.6
Quiet, tranquil	70	8.2
White sand	68	8.0
Clean	62	7.3
Fantastic, awesome, magnificent, incredible	58	6.8
Water quality	44	5.2
Unspoiled, untouched, undeveloped	44	5.2
Heavenly, magical, spectacular	39	4.6
Serene, panoramic	35	4.1
Natural, well preserved	31	3.6
Bad weather	27	3.2
Fun, enjoyable, delightful	23	2.7
Pure, virgin	22	2.6
Paradise	20	2.3
Secluded, remote	19	2.2
Warm, hot	16	1.9
Enchanting, dream, romantic	15	1.8
Refreshing	12	1.4
Blue	9	1.1
Wild, tropical, lush, green	8	0.9
Nice	7	0.8
Friendly	6	0.7
Unique	5	0.6
Safe beach	4	0.5
Exotic, exquisite	4	0.5
Uncrowded	3	0.4
Turtles, goannas, wildlife	3	0.4
Inviting, desirable	3	0.4
Spacious, vast	3	0.4
Unusual, interesting	3	0.4
Crystal	2	0.2
Spiritual	2	0.2
Breathtaking	2	0.2
Accessible	1	0.1
Sandflies	1	0.1
Healthy	1	0.1
Salty	1	0.1
Crowded	1	0.1
Rewarding	1	0.1
Family setting	1	0.1

APPENDIX 9. NUMBER OF OBSERVATIONS BY SETTING OVER 15 VISITS

Trip Number	Setting Visited	Seaplane Flyovers	Seaplane Events	Helicopter Flyovers	Helicopter Events
1	2	0	0	0	0
2	2	1	2	0	0
3	2	0	3	0	0
4	2	1	0	1	0
5	6	1	0	2	0
6	2	1	0	3	0
7	2	3	3	3	0
8	6	0	0	2	0
9	2	3	2	1	0
10	2	1	1	0	0
11	2	2	0	0	0
12	2	0	0	0	0
13	6	4	0	2	0
14	2	3	1	1	1
15	2	0	0	0	0

APPENDIX 10. A SUMMARY OF HAMILTON'S (1999) AIRCRAFT REVIEW

OVERVIEW

Background

Aircraft overflights and associated noise in national parks is an environmental management issue which has had the attention of researchers in the United States of America since the late 1980s but which is only beginning to be addressed in Australia, particularly as far as quantitative studies are concerned. The Great Barrier Reef Marine Park Authority (GBRMPA, the Authority) is at the first stage of developing policy for the management of aircraft operations in the Great Barrier Reef Marine Park (GBRMP, the Marine Park). This study and the social survey being undertaken concurrent with it by consultant Jayne Ormsby and Scott Shafer, are initial steps toward such policy development. To date, the only published discussion on the management of aircraft operations in the Marine Park is a paper by Adami and Jennings dated April 1995 and titled *Draft discussion paper: Management of aircraft operations in the Great Barrier Reef Marine Park*.

The Marine Park area has been divided into a range of recreation opportunity spectrum (ROS) setting designed to provide for a variety of user tastes and environmental needs. Various anthropogenic variables act upon these settings subsequently influencing their attributes. Aircraft overflight frequencies and their associated noise levels are two such variables and are investigated in this research relative to the four settings along Whitehaven Beach, Whitsunday Island. The settings along Whitehaven Beach are High Use (Setting 2) at the southern most end of the beach, Moderate Use (3), Natural (4) and Protected (5) at the northern most end of the beach. Due to the small size and limited methodology of this study, it is best considered as a pilot study. However, one of its intended outcomes is to help determine whether or not a more complete baseline study, with the potential to lead into a monitoring program, of aircraft activity at Whitehaven Beach and the Whitsunday Islands generally, is warranted.

Specifically, this research seeks to assess aircraft sound impact and activity in the four ROS settings along Whitehaven Beach and to compare the results between settings, in order to determine whether or not the settings are receiving a gradient of impact in line with the definitions of the settings.

Methods

The study site is Whitehaven Beach, Whitsunday Island. The main data for the study was collected during two four-day long field trips in October 1998, a relatively low use season for aircraft tour operators. Data was collected at four set sites along the beach, each site situated approximately in the middle of the setting it represented. Sound level data was primarily collected with Techcessories analogue sound level meters, which do not meet Australian Standards for sound level meters. Data was collected on the frequency of aircraft overflights and their associated sound levels as well as on background sound levels. As a comparison with aircraft impacts, data was also recorded on watercraft and human activity levels and on watercraft sound levels.

Main Results

In terms of the frequency of overflights and their sound level durations above background sound levels, sites (settings) 3 and 4 were found to experience the greatest impact from aircraft followed by sites (settings) 5 and then 2. Thus the High Use setting which would be expected to experience the highest impact actually experienced the lowest impact. In terms of the absolute and average maximum aircraft induced sound levels experienced, no significant difference was found between settings although the raw results suggested that sites 3 and 4 experienced the greatest impact from these variables followed by sites 2 and 5. Most aircraft events (88%) registered above background sound levels and most (71%) affected three or all study sites.

Overall, the busiest time of day was from 11:30 to 13:30. The most common types of aircraft observed were seaplanes, followed by helicopters, other light aircraft and high altitude jets. Seaplane takeoffs and helicopter landings and takeoffs had the greatest sound impact. Setting 2 was found to receive the greatest impact from watercraft and people. Settings 3, 4 and 5 received similar levels of impact from both of these variables.

Conclusions

Although a significant difference was found between the frequencies and duration above background sound levels of aircraft events between settings, the trend exhibited did not follow that expected by the definitions of the ROS settings. While in terms of aircraft induced sound impact, no significant difference was found between settings. Thus, showing no gradient of impact at all for this variable. Subsequently, it is concluded that in terms of aircraft activity and sound impacts, the recreation opportunity spectrum along Whitehaven Beach is not functioning, as it should.

Rudimentary data collection on watercraft activity and sound levels and on the numbers of people present in the settings along the beach suggests that in terms of these variables, the recreation opportunity spectrum along Whitehaven Beach is much closer to functioning as it should. Setting 2 experienced the highest impact in both cases. Even so, very little difference was observed and recorded between Settings 3, 4 and 5. Thus the expected gradient in use between these settings was not observed.

APPENDIX 11. THINGS THAT ADDED TO VISITORS ENJOYMENT WHILST AT WHITEHAVEN BEACH

Things that added to enjoyment	Frequency	Percent
White silica sand and beach	120	19.9
Quality of the water (clean, clear)	77	12.8
Natural, unspoiled, uncommercialised	73	12.1
Cleanliness of Whitehaven Beach	70	11.6
Wildlife and marine-life (turtles, goannas)	39	6.5
Crew friendliness and information	34	5.6
Beach activities (swimming, snorkelling)	33	5.5
Quiet and peacefulness	29	4.8
Uncrowded	26	4.3
Shade tents on beach	19	3.2
Views and scenery	15	2.5
Weather	14	2.3
The Hill Inlet lookout and track	11	1.8
Journey to Whitehaven Beach	10	1.7
Seclusion	8	1.4
Water supplied on beach by operator	7	1.2
Other friendly people	4	0.7
Space	3	0.5
Great food	3	0.5
Closeness of the boat to the beach	2	0.3
Airconditioning on boat	2	0.3
Beach talks	1	0.2
Picnic tables	1	0.2
Safe environment	1	0.2
Unique transport by seaplane	1	0.2

**APPENDIX 12. THINGS THAT DETRACTED FROM VISITORS' ENJOYMENT
WHILST AT WHITEHAVEN BEACH**

Things that detracted from enjoyment	Frequency	Per cent
The weather	44	34.6
Lack of shade	16	12.0
Sea sickness	11	8.7
Too many people, too crowded	10	7.9
Lack of change rooms and toilet facilities	7	5.5
Poor service related to operator	7	5.5
No fish or coral	5	3.9
No walking tracks	4	3.1
Poor condition of Tongue Point track	3	2.4
Sealice	3	2.4
Fences on beach	2	1.6
Pollution from boat (oil)	1	0.8
Sand	1	0.8
Water	1	0.8
Noise from planes	1	0.8
Shade tents on beach	1	0.8
No water sports at beach	1	0.8
Sandflies	1	0.8
Jellyfish and stingers	1	0.8
Not enough time on beach	1	0.8
Larger boats an eyesore	1	0.8
Boring	1	0.8
Rubbish on beach	1	0.8
Jet ski activities annoying	1	0.8

APPENDIX 13. CONDITIONS THAT HAD AN INFLUENCE UPON VISITORS' ENJOYMENT AT WHITEHAVEN BEACH

Positive Conditions			Negative Conditions		
	F	%		F	%
Enjoyed environment (no negative influences)	8	11.4	Too many people	16	22.8
Watching seaplanes	7	10.0	Aircraft noise	6	8.6
Watching other people/other people's enjoyment	6	8.6	Aircraft annoying	6	8.6
No noise, quietness	3	4.4	Noise large boats	5	7.1
Watching boats	2	2.9	Noise small boats	2	2.9
Enjoyed seaplane trip	2	2.9	Visual impact of large boats	2	2.9
Perfect number of people	1	1.4	Visual impact of Shade tents	1	1.4
			People's noise	1	1.4
			Too many boats	1	1.4
			Boats and planes detracted from natural environment	1	1.4

APPENDIX 14. SUGGESTED IMPROVEMENTS TO WHITEHAVEN BEACH

Improvements	Frequency	Per cent
No improvements (leave beach natural)	180	45.0
Provision of shade on beach	37	9.3
Service of tourist operator	35	8.8
Stay longer on beach	33	8.3
Better weather	27	6.8
Better toilet facilities	18	4.5
More information (island, coral, wildlife)	13	3.3
More bushwalking tracks	10	2.5
Beach in general	7	1.8
Too many boats and people in small area	7	1.8
Keep boat numbers and people monitored	5	1.3
Build a look-out	4	1.0
Improve the path to lookout at Tongue Point	3	0.8
No seasickness	3	0.8
Ability to stay overnight	3	0.8
No jet skis allowed	3	0.8
Bar on the beach	2	0.5
Less boats	1	0.3
Signs to help stop pollution	1	0.3
Less shade tents on beach	1	0.3
More seating in shaded areas of beach	1	0.3
No fences	1	0.3
Moorings for boats	1	0.3
Reduce rubbish in vegetated area	1	0.3
Place to buy souvenirs	1	0.3
Bins on beach	1	0.3
A barbecue	1	0.3

APPENDIX 15. FUTURE HOLIDAY DESTINATIONS IN THE WHITSUNDAYS REGION

Future holiday destination	Frequency	Per cent
Whitsunday Islands	57	34
Outer reef	37	22
Hamilton Island	28	17
Whitehaven Beach	14	8
Hayman Island	9	5.3
Daydream Island	5	3.0
Whitsunday Island	4	2.4
Heart Reef	3	1.8
Other destination, unrelated to Whitsundays region	3	1.8
Somewhere remote	2	1.2
Long Island	1	0.6
Hill Inlet	1	0.6
Hook Island	1	0.6
Brampton Island	1	0.6
Lindeman Island	1	0.6

APPENDIX 16. TYPE OF TRIP VISITORS WOULD LIKE TO TAKE ON A FUTURE HOLIDAY TO THE WHITSUNDAYS REGION

Type of trip	Frequency	Per cent
Yacht	46	35
Boat in general	25	19
Relaxing holiday	13	10
Helicopter or plane	10	8
Commercial tourist boat	9	7
Diving or snorkelling trip	8	6
Catamaran	5	3.8
Larger boat	3	2.3
Cruise	3	2.3
Day trip	3	2.3
Package deal (island accommodation and transfers)	2	1.5
Smaller boat operator	1	0.8
Charter boat	1	0.8
Runabout	1	0.8

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