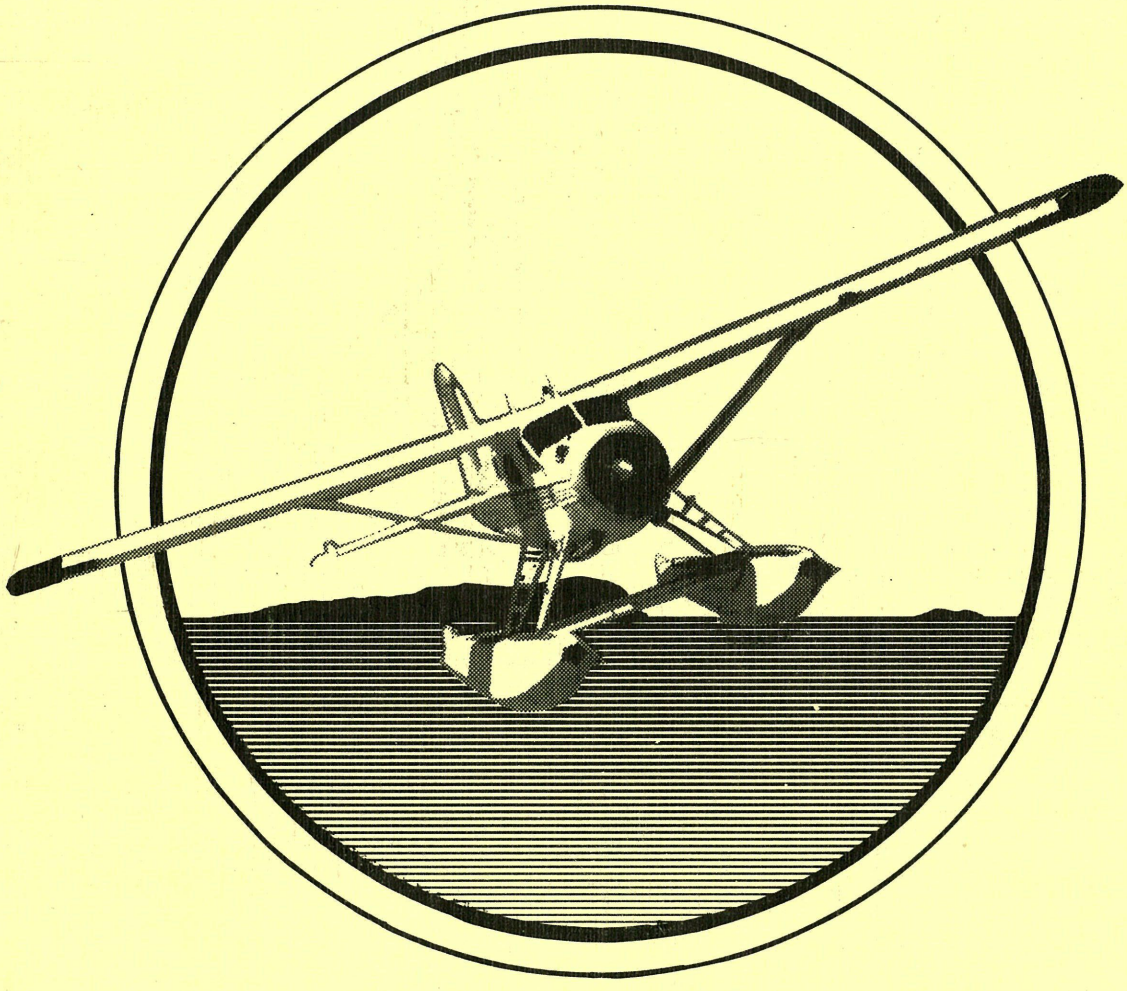
Seaplanes at Green Island



A study for the Great Barrier Reef Marine Park Authority

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SEAPLANES AT GREEN ISLAND

A STUDY FOR THE GREAT BARRIER REEF MARINE PARK AUTHORITY

JUNE 1986

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CONTENTS

THE STUDY BRIEF

CONSULTANTS' BRIEF

SEAPLANES AT GREEN ISLAND

PURPOSE OF THE STUDY

Under the Zoning Plan and regulations of the Cairns Section of the Great Barrier Reef Marine Park, the operation of seaplanes around Green Island requires a permit from the Great Barrier Reef Marine Park Authority. The Authority is therefore responsible for assessing whether seaplane operations are a reasonable use in particular areas of the Marine Park.

There is intermittent but possibly increasing use of seaplanes to visit Green Island. Three operators are currently involved. Complaints have been received that these operations disturb island visitors due to both noise and potential danger to snorkellers. The seaplanes operate to the sand spit on the north west of the island, near the jetty. This is a heavily used swimming, snorkelling and watersport area. This study seeks to address the possible conflicts between seaplanes and island visitors. It is suggested that possible conflicts between vessels and visitors also be considered in order to place the assessment into context. The study is designed to provide guidelines for management and the successful consultant will liase closely with Great Barrier Reef Marine Park Authority and Queensland National Parks and Wildlife Service officers.

AIM

The aim of the study is to determine how seaplanes affect peoples' perceptions of their experience on Green Island. The information produced should assist the Great Barrier Reef Marine Park Authority in evaluating applications for permits to operate seaplanes in the vicinity of Green Island, in particular how seaplanes affect the "existing use and amenity of the area and adjacent areas".

THE STUDY

The proposed study consists of two parts, addressing background information of visitor, vessel and seaplane use of Green Island and addressing visitor perceptions of seaplanes. Most emphasis should be placed on Part B.

PART A.

- Document annual use of Green Island by visitors (day and overnight), seaplanes, and vessels operating in the same area as seaplanes;
- Prepare map(s) showing type and intensity of use of areas of Green Island by visitors, vessels and seaplanes;
- Produce map(s) showing noise contours for seaplanes, vessels, and any other major noise source; and
- Produce map(s) showing line of sight information for vessel facilities and the seaplane landing area.

PART B.

Develop and administer a short questionnaire to visitors on Green Island to ascertain perceptions of seaplanes. It is proposed that perceptions of seaplanes be contrasted with perceptions of vessels to provide a context for assessment.

Visitation of Green Island is approximately 150,000 visitor days per annum. A representative sample should be selected; there is no a priori evidence that the sample needs to be stratified.

TIMING

A draft report is required by 1 June 1986. The final report should be prepared in consultation with GBRMPA officers and should contain recommendations on the management of seaplane activity in the vicinity of Green Island. The recommendations should refer to the Zoning Plan and Regulations for the Marine Park and have regard to the requirement to provide for 'reasonable use'. The final report should be produced by 1 July 1986.

SUMMARY OF THE MAIN FINDINGS OF THE STUDY

AND MANAGEMENT CONSIDERATIONS

2.1 Any seaplane operating at Green Island is likely to be noticed by a very high proportion of visitors.

2.2 The seaplane used in this study was almost inaudible on alighting and while taxiing. Noise made at start-up on the beach is likely to momentarily startle some beach users. Noise made on take-off is clearly noticeable on the beach and jetty, but far less intrusive over much of the Resort area of the Island. In the vicinity of the outdoor restaurant area, seaplane take-off can not always be detected. Level and duration of the noise from seaplane take-off are similar to those of an overflying aircraft. (These results may alter with different types of seaplanes)

2.3 Potential exists for conflicts between swimmers/snorkellers and seaplanes alighting and taking-off, but the risk appears to be low.

2.4 Conflicts between people swimming, wading or using the beach at the water's edge and the seaplanes manoeuvring into or away from the beach are frequent. Inconvenience is common, and the potential for a serious accident high. The seaplane moored over a relatively small arc of the north-west beach of the island.

2.5 The problem of conflicts arising from seaplane access to the shore is compounded by, and inextricable from, use of the shoreline and beach by private boats. Private boats on the beach constrict access to the water's edge both for beach users and seaplanes. Fine, relatively calm weather and a weekend or public holiday would be the combination of events which produce high competing demands for shoreline space by beach users, private boats and seaplanes. Competition may be far less severe under other conditions.

2.6 Physical separation of people and seaplane movements, both at the water's edge and in the immediate vicinity of the shore would be the only way to prevent these conflicts from occurring.

2.7 Seaplane activity at Green Island is regarded by most day visitors as an acceptable component of their experience at Green Island. About one third reported that the presence of seaplanes contributed positively to their enjoyment - being regarded as interesting or a novelty.

2.8 A small number of day visitors (approximately 1 in 20) regarded any seaplane activity at Green Island as incompatible with their expectations of the island and reported that seaplanes decreased their enjoyment. Noise and beach conflicts were their major concerns.

2.9 Increasing the frequency of seaplane operations resulted in a significant shift in day-visitors' attitudes. On the day of "high" activity, fewer visitors reported that seaplanes increased their enjoyment and more reported that they decreased their enjoyment - though the latter were still only a small proportion of visitors (approximately 1 in 7). There was little difference in attitudes between the days of "low" and "medium" seaplane activity, with the inference that visitors "good-will" towards seaplanes is elastic with respect to the number of aircraft movements - at least up to the number on the "medium" activity day.

2.10 Most day visitors also regard boating activity at Green Island as an acceptable component of their visit. For most, boats, either private or ferries, increased the enjoyment of their visit. Boats decreased enjoyment of the visit for a small proportion of visitors (up to 1 in 5 on the day of high boating activity), mostly for reasons of occupation of beach space and conflict with swimmers. No visitor commented on noise from boats.

2.11 Guests staying in the Green Island Reef Resort generally noticed both seaplanes and boats coming and going. Most found no conflict in either seaplane or boating activity and many reported that they increased their enjoyment of the island.

MANAGEMENT CONSIDERATIONS

Some outline management considerations and brief commentaries, are listed below:

A. NO CONTROLS ON SEAPLANES

This would ignore the potential for a large increase in the number of seaplane flights and the existence of the small but increasing proportion of visitors whose enjoyment of the visit to Green Island is reduced as flight frequency increases.

B. EXCLUDE SEAPLANES

Some visitors, those whose expectations of Green Island were of a more pristine or natural environment, would benefit. However they are a minority. Seaplanes are recognized by a large proportion of visitors as compatible with their expectations of Green Island. The large number reporting that seaplanes increased their enjoyment must be given considerable weight.

C. LIMIT NUMBER OF OPERATIONS BY:

FREQUENCY - the results from the present study indicate that limitation of the absolute number of operations may be justified, and some number between the "low" and "medium" levels of activity in this study may be appropriate.

PURPOSE - limitation by flight purpose may be an effective way of achieving limitation of frequency. Charter flights, scheduled services and joy-flights operating out of Green Island are three possible categories of purpose. The scheduled service purpose would have a fixed number of flights. Joy flights would be a purpose which would generate a large number of seaplane operations.

D. REDUCE SEAPLANE/BEACH-USER CONFLICTS

Reduction of the risk and inconvenience of these conflicts must be a high priority in any management of seaplanes at Green Island. Several strategies include:

-a marked zone for seaplanes on the beach. This option would appear to be impossible to police. Even if such a marked area were observed, given the large number of beach users and the small available area of beach, this solution is inequitable.

-mooring bouys/pontoons off the beach. Without shore-based assistance, transport of seaplane passengers to and from the beach is inconvenient. Facilities to provide for this water based transport could be reasonably expensive for seaplane operators to install and maintain.

-floating pontoon connected to the jetty. A floating pontoon, sufficiently long to give clearance from the jetty while manoeuvring, could be designated specifically for seaplanes (but could possibly also be used by small craft as well for loading and unloading - but not mooring) This would have the advantage of ease of access for seaplane passengers, a relatively protected and "tide-free" mooring for seaplanes, and of concentrating both water and air transport modes in the one location on the island. Facilities would be relatively expensive and most likely would have to be provided at public expense - perhaps recouped to some extent by a fee for use.

(This study has not looked at the technical or economic feasibility of the latter two options).

E. DATA ON SEAPLANE USE OF GREEN ISLAND

Seaplane operators should routinely provide the responsible authority with details of the number and purpose of flights to Green Island.

INTRODUCTION:

GREEN ISLAND, VISITORS AND SEAPLANES

3.1 Green Island

Green Island is located 27 kilometers north-east of Cairns. The island, and its surrounding reef are part of Australia' Great Barrier Reef. Green Island has an area of approximately 12 hectares of which some 7 hectares are National Park and much of the rest is devoted to tourist facilities. The island is a low tree-covered coral cay, largely fringed by sandy beaches.

3.2 Visitors

Because of its natural environment and relative accessibility from Cairns, Green Island has been a popular tourist destination for a major part of this century. Visitors to the island can engage in a wide range of activities - swimming, snorkelling, sunbaking, reef walking, beach and forest strolls as well as using the various commercial facilities available. The main reasons for visiting Green Island appear to be to see the Great Barrier Reef, to see the Island's advertised attractions and to have a relaxing day's outing (Queensland National Parks and Wildlife Service, 1980). Peak daily visitation to the island was estimated (Economic Associates Australia, 1983) to be 950 to 1000, with an annual visitation of about 130,000 in 1978. Most visits to the island are for one day; the only overnight accommodation having a capacity of about 80 guests.

3.3 Access

Access to Green Island is predominantly by ferry, with journey time from Cairns of 40 minutes at a cost of $21 return, or a slower journey of about 90 minutes at a cost of $12 return. Alternative access is by private boat or by seaplane. It is the latter that is of particular interest in this study. Journey time to Green Island by seaplane is approximately 9 minutes. Seaplane company brochures advertised a return fare to Green Island from Cairns of $35, including a stay on the island.

3.4 Seaplanes

At the present time there are no scheduled seaplane services to Green Island and seaplane access is by charter arrangement. All charter flights to Green Island originate in Cairns and may be specifically to Green Island or to Green Island as part of a longer aerial tour of the Reef. At the time of this study there were two seaplane companies operating out of Cairns: Amphibious Airways and Aquaflight Airways and both use 8 seat Beaver Seaplanes. No attempt has been made in this study to document the history of seaplane operations to Green Island, however it can be noted that another company, Cairns Seaplane Airways, using a Cessna 206 Amphibious Aircraft, also operated from Cairns until recently. The Green Island Management Plan (Queensland National Parks and Wildlife Service, 1980) also referred to the Green Island operations of Seaplane Charter Holdings Pty Ltd which commenced demand services to Green Island in 1978.

3.5 Existing Controls on Seaplane Access

Green Island Reef is zoned "Marine National Park B" in the Great Barrier Reef Marine Park Zoning Plan (Great Barrier Reef Marine Park Authority, 1983). The objective of this zoning is:

> ...to provide for the protection of the natural resources of the area while allowing the public to appreciate and enjoy the relatively undisturbed nature of the area.. .

The Zone allows:

> the operation of aircraft....at an altitude of not less than 500 feet above ground or water....

or, with the permission of the responsible agency,

> the operation of aircraft...on the surface of the ground or water; or at an altitude of less than 500 feet above ground or water.

Under these controls, aircraft can operate around and over Green Island, but not below 500 feet. However, in order to alight at Green Island, seaplane operators require a permit from the Great Barrier Reef Marine Park Authority. Such permits have, in the past, contained as as a condition of permit:

> If any operations are conducted to Green Island:
>
> (i) all landings and take-off operation to be carried out on the northern side of a line drawn parallel to the seaward leg of Green Island jetty, at a perpendicular distance of at least 250 metres:
>
> (ii) aircraft to taxi on the water surface from landing/ take-off location using minimum engine revolutions; and
>
> (iii) at all times whilst airborne aircraft are to maintain a minimum distance of 300 metres from any part of Green Island.

3.6 Existing and Potential Seaplane Operations at Green Island

The frequency of past seaplane operations at Green Island has not been adequately documented. Flight operations are recorded by the Department of Aviation but are only retained for a short period. Pilots also maintain logs of their operations. This study has not been able to pursue either of these sources. However, on anecdotal evidence it appears that, on average, there would rarely be more than about five or six flights per week to Green Island at present. Further, until this study, the maximum number of operations to Green Island in any one day appears to have been about four. One pilot could recall only one occurrence of two seaplanes being on the water at Green Island at the same time. In summary, seaplane operations at Green Island to date have been sporadic.

However, a considerable increase in these operations above the present low-key level of activity at Green Island is possible. Potential changes include:

- -a significant increase in the present charter operations particularly if the margin between ferry charges and seaplane charges were to become smaller,

- -a scheduled air service between Cairns and Green Island,

- -a charter service, providing very short duration joyflights over the reef (say, 10 minutes) and operating from Green Island itself. These flights could be very attractive to day visitors (cf glass bottom boat operations).

THE STUDY

4.1 Overview

This study was conducted on Green Island over three days (10 to 12 May, 1986). On these days the number of seaplane movements at Green Island was manipulated to provide one day of "low" activity (approximating existing seaplane operations), one of "medium" activity, and another of "high" activity. Conditions on each day of the survey are summarized in TABLE 4.1.

TABLE 4.1

SUMMARY OF SURVEY CONDITIONS ON EACH DAY OF THE SURVEY

MAY 1986

		ADULT VISITOR NUMBERS*	SEAPLANE ACTIVITY	FERRY OPERATIONS	PRIVATE BOAT ACTIVITY	WEATHER CONDITIONS
SATURDAY	10	509	low	normal	low	fine
SUNDAY	11	657	high	normal	medium	fine
MONDAY	12	616	medium	normal	low	fine

* These numbers refer to day-trip visitors who purchased adult ferry tickets which included a visit to Green Island as all or part of the day's activity. (All commercial ferry operations, except that of the "Fitzroy Flyer", are included in these figures.) They represent approximately 50% to 60% of peak visitor activity

The study measured noise levels, observed interactions between seaplane movements and beach users and asked visitors about the effect of seaplanes and various other things on the enjoyment of

their visit. Because the majority of visitors to the island are "day visitors", the populations exposed to the different levels of seaplane activity on each day of the study can be regarded as independent. Opinions were also sought from the resort guests who stay longer than one day on the island. The small number of island visitors who used private transport to the island were not able to be included in the survey.

4.2 Seaplane Movements

The Seaplane used in the study was a 7 passenger DHC-2 Beaver float plane operated by Aquaflight Airways Pty Ltd. This was the only operational seaplane available for charter out of Cairns at the time of the study. The pilot was requested to alight and take off from Green Island in the same way as would be done for a routine charter operation, taxiing into the shore and anchoring on the beach after each alighting. More details on these operations are described in Section 7.2.

All-day visitors to the island would have been present for 2 (or 3) arrivals and departures on the day of "light" activity, 6 (or 7) arrivals and departures on the day of "medium" activity and 10 (or 11) arrivals and departures on the day of "heavy" activity. The hours spent on the island by day visitors can vary slightly and this accounts for the numbers in parentheses above. Seaplane operations on each day of the study are described in detail in TABLE 4.2.

TABLE 4.2

SUMMARY OF ARRIVALS AND DEPARTURES OF SEAPLANES AT GREEN ISLAND

	No.	ARRIVE	DEPART
SATURDAY 10 MAY	"LIGHT" ACTIVITY		
	1	1115	1145
	2	1430	1445
	3 £	1530 £	1540 £
	4 *	1800 *	1805 *

Intervals between departures: 3h,50m£,2h25m*

SUNDAY 11 MAY	"HEAVY" ACTIVITY		
	1 *	0830 *	0915 *
	2	1210	1225
	3	1235	1240
	4	1300	1320
	5	1330	1340
	6	1345	1350
	7	1355	1405
	8	1420	1425
	9	1430	1435
	10	1443	1450
	11	1455	1505
	12 *	1800 *	1805 *

Intervals between departures: 3h10m*,15m,40m,20m,10m,
15m,20m,10m,15m,15m,3h*

MONDAY 12 MAY	"MEDIUM" ACTIVITY		
	1	1125	1225
	2	1235	1240
	3	1245	1315
	4	1329	1415
	5	1425	1445
	6	1450	1455
	7 £	1525 £	1535 £
	8 *	1800 *	1805 *

Intervals between departures: 15m,35m,1h,30m,10m,40m£,2h30m*

* = outside the period of normal day trip visitation
£ = seaplane operation outside the control of the survey team

Land based aircraft also passed near the island occasionally, but no details of these are recorded.

THE VISITOR SURVEY

5.1 The Questionnaire

The specific task of the study was to ascertain visitors' experience and perception of seaplanes in the context of their visit to Green Island. The choice of survey instrument, dictated by the study budget, was a questionnaire which could be completed by respondents without instruction or supervision. With this simple mode of administration the questionnaire itself had to be simple. In terms of visitors' experience and perception of seaplanes, the design reduced to ascertaining responses to two specific questions:

- -did visitors notice the seaplane activity?
- -did the seaplane activity influence the visitors' enjoyment of their visit?

with a positive response to the first question required before proceeding with analysis of response to the second question.

The scale used in the enjoyment question was a five-point bi-polar one, ranging from "increased your enjoyment a lot" through "did not affect you" to "decreased your enjoyment a lot". It will be seen later that visitors' responses clearly justified the choice of a bi-polar scale. In addition to these two questions, respondents were invited to write specific comments on the questionnaire "to give the study team a better understanding...(of reasons for the responses)". These "open" responses to items on the questionnaire on seaplanes and on boats are tabulated in Appendices A and B. While they are not amenable to statistical analysis, and certainly should not be taken to

represent all the possible opinions of visitors, perusal of them does provide considerable insight not permitted by the closed responses allowed in the body of the questionnaire.

The purpose of the survey was masked by having each of the seaplane items as one of a battery of eight questions concerning some physical or social aspect of Green Island's environment that a visitor might reasonably be expected to experience. The items used in masking were selected, primarily, from those used in the Green Island Visitor Survey conducted in 1978/79 (Queensland National Parks and Wildlife Service, 1980). The masking items also included boats visiting the island to allow specific contrasts of the effects of the air and water transport modes.

Further masking was provided by having visitors indicate the activities they undertook on Green Island (also similar to the 1978/79 survey) as well as basic classificatory information. Responses to the masking items are only partially reported here though they are used initially to compare the population of respondents in the present survey, and their activities, with those reported from the 1978/79 surveys.

Overall, the questionnaire was presented to respondents as a "Visitor Opinion Survey" which will help in making decisions about the future management of Green Island. The questionnaire is shown in Figure 5.1.

Figure 5.1(a)

VISITOR OPINION SURVEY - GREEN ISLAND

PLEASE COMPLETE NOW AND DEPOSIT BEFORE DEPARTURE

This survey is being conducted by the Institute of Applied Environmental Research at Griffith University and the results will be reported to the Great Barrier Reef Marine Park Authority. Individual people will not be able to be identified in the results.

THIS SURVEY WILL HELP IN MAKING DECISIONS ABOUT THE FUTURE MANAGEMENT OF GREEN ISLAND. YOUR OPINIONS ABOUT SOME SPECIFIC MATTERS WILL PLAY AN IMPORTANT ROLE IN THESE DECISIONS. YOUR TIME AND EFFORT IN ANSWERING EACH QUESTION IS GREATLY APPRECIATED.

---

1. On your visit did you?

(MARK ONE BOX)

visit Green Island only - just for the day ☐

visit Green Island and Outer Reef - just for the day ☐

visit Green Island for several days (write in number of days) ☐

2. PLEASE INDICATE:

Sex

female ☐

male ☐

Usual Place of Residence

☐ Cairns

☐ Cairns District

☐ Brisbane

☐ Another part of Queensland

☐ Another State in Australia

☐ Outside Australia

3. Which of the following activities did you participate in during your visit?

(TICK ONE BOX PER ROW)

	MAJOR ACTIVITY	MINOR ACTIVITY	NO ACTIVITY
coral viewing from the glass bottom boat			
swimming/snorkelling close to the beach			
swimming/snorkelling out on the reef			
fishing			
reef walking			
sunbaking			
walking in the national park			
walking along beach			
nature study			
picknicking			

.[PLEASE COMPLETE OTHER SIDE]

4. During your visit did you notice or experience any of the following?
(TICK ONE BOX PER ROW)

	YES	NO	DONT KNOW
beach erosion			
boats coming or going			
queues for island's attractions			
litter			
seaplanes coming and going			
lack of information about the island's attractions			
concern for safety of self/others while swimming			
awareness of large numbers of visitors			

5. If you noticed or experienced any of these things, how much did they add or detract from the enjoyment of your visit?
(ONE TICK IN EACH ROW OR LEAVE BLANK IF DID NOT NOTICE)

	INCREASED YOUR ENJOYMENT		DID NOT AFFECT YOU	DECREASED YOUR ENJOYMENT	
	a little	a lot		a little	a lot
erosion					
private boats					
queues					
litter					
seaplanes					
information					
swim safety					
numbers of visitors					

6. Would you like to add any comments in the spaces provided below which give the study team a better understanding of your opinions on these specific matters?

EROSION:

BOATS:

QUEUES:

LITTER:

SEAPLANES:

INFORMATION:

SWIM SAFETY:

NUMBERS OF VISITORS:

7. If you wish, please use the space below to comment on other anything else which added to or detracted from the enjoyment of the visit.

ANYTHING ELSE:

HOPE YOU HAD A NICE DAY

5.2 Administration (Day Visitors)

The co-operation of Hayles Holdings Pty Ltd and Green Island Seatel Cruises was enlisted to enable distribution and collection of questionnaire forms on the ferry services returning to Cairns at the end of each day. Immediately on departure from Green Island a short announcement regarding the survey was made over the public address system on the ferry and the questionnaire distributed by a member of the study team to all adult passengers. The introduction on the questionnaire identified both Griffith University and The Great Barrier Reef Marine Park Authority. The survey forms were collected before the ferry arrived in Cairns. The intended definition of "adult" was anyone over seventeen years of age though in practice some visitors younger than this would have completed the questionnaire. With very few exceptions, visitors were well disposed towards the survey and seasickness during the ferry trip was observed by the survey team to be the only major reason for non-completion of questionnaires. Given this administration procedure, only minor cost savings (cost of printing questionnaires and cost of post-survey data entry) would have resulted from sampling from the population of Green Island visitors, hence the choice of a visitor census. Response rates were uniformly good for this type of survey, ranging from 75% to 82% over the three days.

The number of questionnaires satisfactorily completed by day visitors on each day of the survey is shown in TABLE 5.1. Some of the ferries returning to Cairns carry both day-visitors who spent the whole of the day at Green Island and day-visitors who also travelled elsewhere. It was considered undesireable to attempt to

distinguish between these two groups on the ferries. However, as those visitors who travelled beyond Green Island would have experienced only a small portion of the aircraft operations, respondents in this category have been deleted from further analysis in this report.

Subsequent results for day visitors will be presented for the 831 respondents who spent the whole day on Green Island.

TABLE 5.1

NUMBERS OF QUESTIONNAIRES SATISFACTORILY COMPLETED BY DAY VISITORS AND GREEN ISLAND REEF RESORT GUESTS ON EACH DAY OF THE SURVEY

	DAY VISITORS		GREEN ISLAND REEF RESORT GUESTS	
	visit Green Island only	visit Green Island and elsewhere		
Saturday 10 May	251 (75%)*	171	17 £	439
Sunday 11 May	319 (82%)*	154	11 £	483
Monday 12 May	261 (81%)*	141	11 £	413
Tuesday 13 May	-	-	33 @	33
	831 (80%)*	466	71	1368

* percentages estimate the survey's capture rate of those day visitors who spent the whole day on Green Island. The estimates are based on the population of adult tickets sold by the ferry operators for visits to Green Island only.
£ captured on their return trip to Cairns
@ surveyed at breakfast in the Resort.

5.3 Administration (Green Island Reef Resort Guests)

Green Island Reef Resort guests stay on Green Island an average of about three days. Those guests who departed on any of the three days of the study were captured by the survey on their return trip to Cairns. Guests in residence at the end of the survey period were surveyed, at breakfast, on the following day. The questionnaire used in the day-visitor survey was also used in the guest survey. TABLE 5.1 also shows the number of questionnaires satisfactorily completed by Green Island Reef Resort guests on each day of the survey.

RESULTS OF THE VISITOR SURVEY

DAY VISITORS (Who visited Green Island only)

6.1 Some Characteristics of the Sample: Place of Residence and Activities while on Green Island

The female:male ratio in the sample of 831 respondents was 50:50. The usual place of residence of respondents is shown in TABLE 6.1. Less than 1 in 5 were from Cairns and district with nearly two thirds from interstate or overseas. The places of residence of respondents in the current survey are similar to those reported in the Queensland National Parks and Wildlife Service in April 1979 - a survey in an "off-peak" period - though with a slightly higher proportion of overseas visitors in the current survey. These figures are averages over the three days days of the survey and day to day variations were observed. The most important of these was that 31% of respondents were local (Cairns and District) on the Sunday compared to 12% on the other two days of the survey. (This co-incided, by chance, with the day of high seaplane activity and also the day on which there were the largest numbers of private craft on Green Island. The interactions between these factors is discussed later in the report.)

TABLE 6.1

USUAL PLACE OF RESIDENCE OF DAY VISITORS

	This Survey (May 86)	August 78 (peak)	April 79 (off-peak)
Cairns	13%	9%	10%
Cairns District	6%	3%	7%
Brisbane	5%	26%	13%
other Queensland	12%	23%	12%
interstate	44%	31%	44%
overseas	21%	6%	14%
	100% (n=831)	100% (n=458)	100% (n=194)

The sample in this survey can also be compared to earlier surveys in terms of the activities in which respondents participated while on Green Island - TABLE 6.2. Activity participation rates generally parallel those reported in the earlier surveys, except for the glass bottom boat, reef walking and sunbaking - and the latter differences can probably be explained by weather and tidal conditions.

The purpose of this comparison is to confirm that there was nothing particularly unusual about the period over which the current survey was conducted and, further, that there seems to be little difference, at least in terms of activities undertaken by visitors, between peak and non-peak periods.

TABLE 6.2

ACTIVITY PARTICIPATION BY DAY VISITORS

	This Survey (May 86)	August 78 (peak)	April 79 (off-peak)
glass bottom boat	45%	75%	70%
swimming near beach	62%	50%	58%
swimming/snorkelling	26%	20%	34%
fishing	1%	2%	5%
reef walking	19%	31%	38%
sunbaking	64%	44%	49%
national park walk	71%	67%	73%
walking along beach	77%	73%	70%
nature study	32%	30%	36%
picniking	26%	21%	17%
	(n=831)	(n=458)	(n=194)

More detailed investigation, beyond what is shown in the Table, indicates that only a small proportion of day visitors (8%) had not participated in at least one of swimming/snorkelling, sunbaking or walking along the beach. The relevance of this to the present investigation is that, for the most part, these activities would have taken place in the same area as that in which the seaplane operated. The vast majority of respondents would have had the opportunity to see the seaplane moored on the beach, taking off and alighting, or both - at least on the days of high and medium seaplane activity.

6.2 Noticing Seaplane and Boating Operations

Ninety per cent of day visitors reported that they noticed sea planes coming or going and this percentage was almost constant over the three days of the study. From this it is clear that

seaplanes are a very "noticeable" feature at Green Island - two aircraft operations at Green Island were noticed by the same proportion of visitors as ten operations. Similarly, 77% reported that they noticed boats coming or going. Again there was very little difference in the proportion of respondents noticing boating over the three days of the survey. Ferry operations were the same on each day though many more private boats were present on the Sunday.

While other items in this battery of questions were included for masking purposes only, some context for these response on seaplanes and boats is provided by:

58% noticed erosion
20% noticed or experienced queues
28% noticed litter
12% experienced lack of information on attractions
15% experienced concern for swimming safety
61% noticed large numbers of visitors.

(There is no suggestion that this list is comprehensive with regard to aspects of Green Island which are important to visitors.)

These results serve to confirm that, as most people's activities were aquatic oriented, the majority of visitors were well aware of both seaplane and boating activity. The 132 respondents who reported that they did not notice seaplane operations will be excluded in the subsequent analysis of respondents assessments of their effect on enjoyment and the 233 respondents who did not notice boating activity will be excluded in the subsequent analysis of the effect of boating operations on enjoyment.

6.3 Effect of Seaplane Operations on Enjoyment

Visitors' reports of the effect of seaplane operations on their enjoyment are shown in TABLE 6.3.

TABLE 6.3

EFFECT OF SEAPLANE OPERATIONS ON VISITOR ENJOYMENT

(Numbers of visitors and row percentages shown)

	INCREASED YOUR ENJOYMENT		DID NOT AFFECT YOU	DECREASED YOUR ENJOYMENT		
	a lot	a little		a little	a lot	
LOW	19 (9%)	56 (27%)	122 (59%)	9 (4%)	2 (1%)	208
MED	29 (13%)	67 (31%)	112 (51%)	11 (5%)	1 (1%)	220
HIGH	21 (8%)	60 (22%)	148 (55%)	31 (11%)	11 (4%)	271
	69 (10%)	183 (26%)	382 (55%)	51 (7%)	14 (2%)	699*

* This is the subgroup of day-visitor respondents who noticed seaplanes coming or going and who responded to the question of their effect on enjoyment.

The majority of respondents who noticed the seaplanes (between 51% and 59% on different days of the survey) reported that they had no effect on their enjoyment of the visit. A further 30% to 44% reported that seaplanes had increased their enjoyment and a much smaller proportion reported that seaplanes had decreased their enjoyment - a maximum of 16% on the day of high seaplane activity. The changes in response over the days of low, high and medium seaplane activity (Saturday, Sunday and Monday respectively) can be seen most clearly in Figure 6.1 where responses of "a little" and "a lot" have been collapsed into a

single category. A higher proportion of visitors reported a decrease in enjoyment on the day of high seaplane activity though there was only marginal difference in effect between the days of low and medium activity. The day of high seaplane activity was also associated with a small reduction in the proportion of visitors for whom seaplanes increased the enjoyment of their visit (though the proportion was higher on the day of medium activity than on the day of low activity).

The best explanation of these results would seem to be that seaplanes alighting and taking-off are regarded by a large proportion of day-visitors as interesting, and perhaps novel, and not incompatible with the experience they sought on Green Island. A small number have their enjoyment decreased by the presence of seaplanes, independent of the number of operations, and these presumably are day-visitors who sought a more pristine environment on Green Island. However, when seaplanes flights became very frequent - perhaps somewhere below the level of operations on the "high" activity day -there starts to be some shift of opinion away from the seaplane operations being acceptable. Some care in interpretation is required, as evidenced by the comments in Appendix B where it can be seen that, amongst respondents who had indicated that seaplanes had not affected them (or even had increased their enjoyment a little), there was awareness of potential disturbance and conflicts from seaplane operations.

Figure 6.1 also shows responses when visitors were stratified into those from Cairns and District and those from elsewhere. This analysis was considered necessary because of the change in the local/non-local composition of the visitor population over the

SEAPLANES COMING AND GOING
(n = 699)

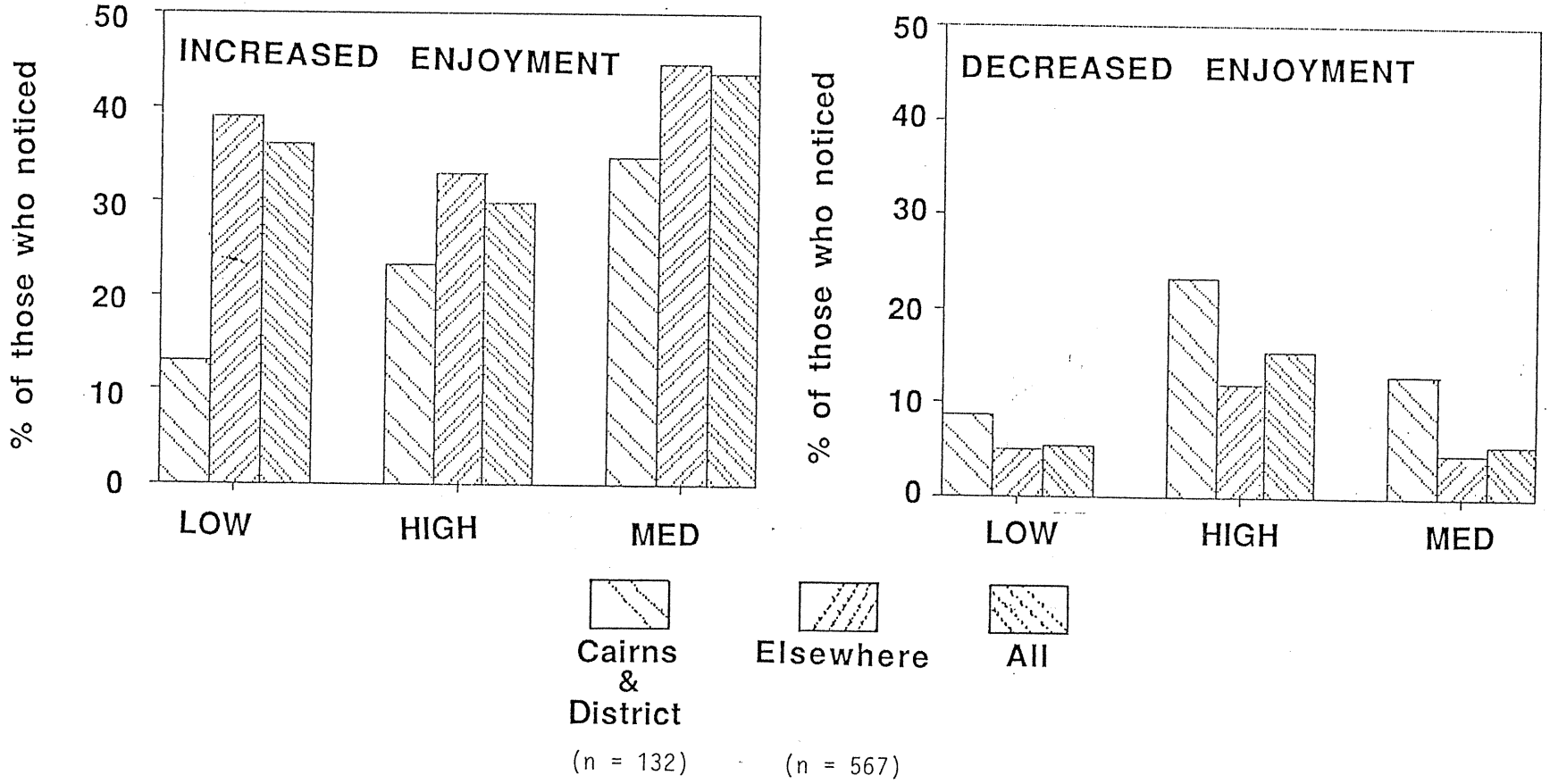


Figure 6.1

three days of the study. The tendency was for a lower proportion of visitors from Cairns and District to report that seaplanes increased their enjoyment, and more (up to 1 in 5) to report that seaplanes decreased their enjoyment. The probable explanation is that these visitors may regard the seaplanes as less of a novelty - either because seaplanes are a common sight on the Cairns Harbour or perhaps this is a repeat visit to Green Island by the respondent and seaplanes have been observed before. However, because of the lower sample size of visitors from Cairns and District the observed difference in response for this group over the three days of the study may have arisen by chance (not significant at the .05 level when using the collapsed enjoyment categories).

6.4 Effect of Boat Operations on Enjoyment

Visitors' reports of the effect of boat operations on their enjoyment can be analysed in a similar way - TABLE 6.4. The definition of "boats" was deliberately left ambiguous and could be taken to refer to the ferry boats or the private boats visiting Green Island.

TABLE 6.4

EFFECT OF BOAT OPERATIONS ON VISITOR ENJOYMENT

(Numbers of visitors and row percentages shown)

	INCREASED YOUR ENJOYMENT		DID NOT AFFECT YOU	DECREASED YOUR ENJOYMENT		
	a lot	a little		a little	a lot	
SAT	12 (6%)	30 (16%)	139 (72%)	8 (4%)	4 (2%)	193
SUN	14 (6%)	35 (15%)	139 (60%)	28 (12%)	17 (7%)	233
MON	9 (5%)	35 (20%)	117 (68%)	10 (11%)	1 (1%)	172
	35 (6%)	100 (17%)	395 (66%)	46 (8%)	22 (4%)	598*

* This is the subgroup of day-visitor respondents who noticed boats coming or going and who responded to the question of their effect on enjoyment.

Boats coming and going at Green Island also produced a mix of reactions amongst visitors with, on average over the three days, 23% reporting that boat operations increased their enjoyment and 12% reporting that boat operations decreased their enjoyment. There was a large proportion, some 66%, who reported that boat operations did not affect them at all. The changes in response over Saturday, Sunday and Monday can be seen most clearly in Figure 6.2 where responses of "a little" and "a lot" have been collapsed into a single category. On Sunday, as could be expected given the good weather conditions, there were considerably more private boats visiting Green Island than on the other two days of the survey (ferry activities were the same on all three days) and it is quite apparent from Figure 6.2 that this resulted in a

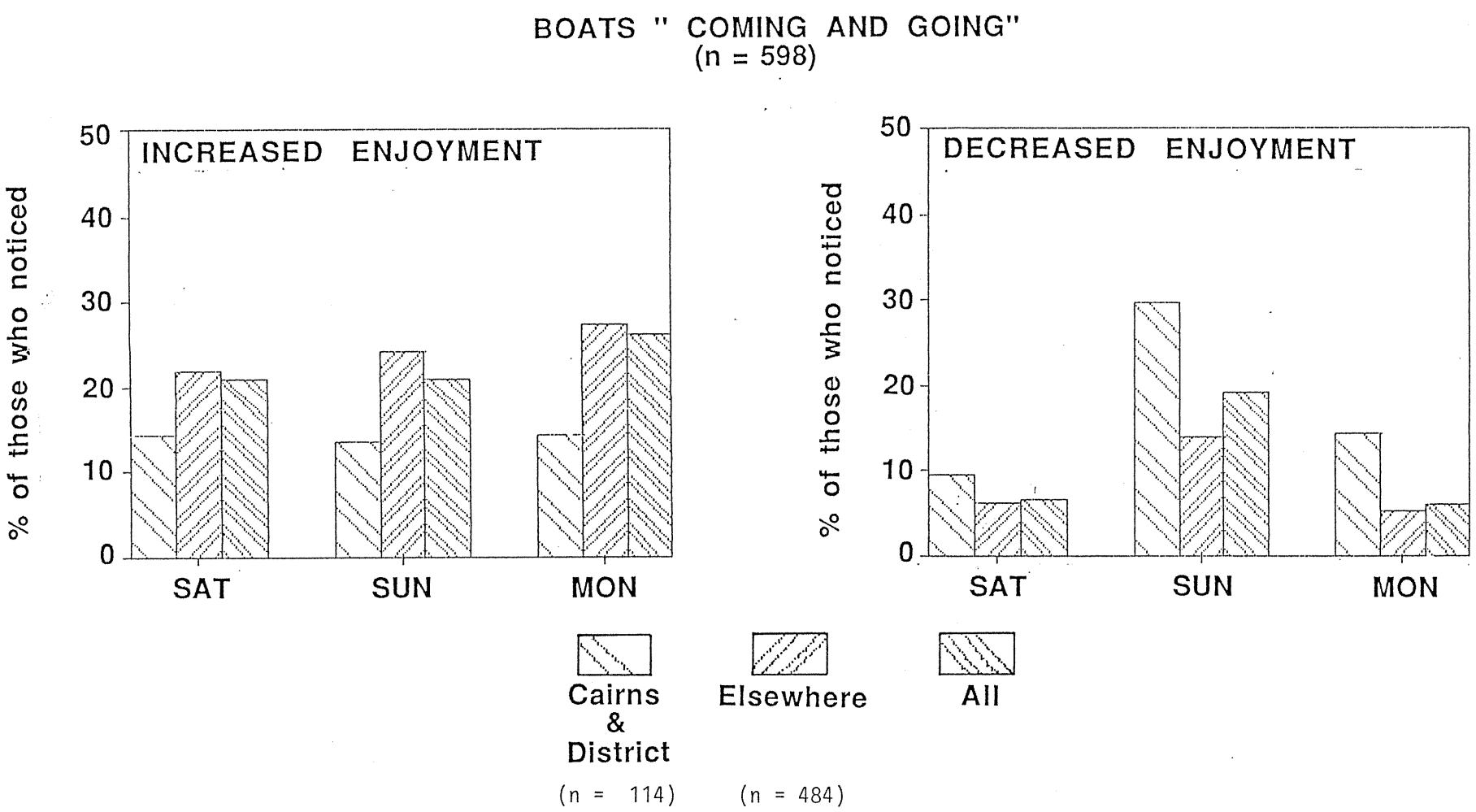

BOATS " COMING AND GOING"
(n = 598)
INCREASED ENJOYMENT
DECREASED ENJOYMENT
% of those who noticed
50
40
30
20
10
0
SAT
SUN
MON
Cairns & District
(n = 114)
Elsewhere
(n = 484)
All

Figure 6.2

considerable increase in the proportion of visitors for whom the boats decreased enjoyment of the visit. The difference in response over the three days of the study was statistically significant (in TABLE 5.4, $x^2 = 28.4$ with 8 df, significance < .001).

The reason for the decrease in enjoyment was apparently conflict between beach users and boats moored on or near the beach (from the open responses in Appendix B). Apart from these adverse effects, boating activity appears to be regarded as part of the experience of an island.

Again, as with the effect of seaplanes, a lower proportion of visitors from Cairns and District tended to report that boats increased their enjoyment and a much higher proportion reported that boats decreased their enjoyment. However again, because of the lower sample size of visitors from Cairns and District the observed difference in response for this group over the three days of the study may have arisen by chance (not significant at the .05 level when using the collapsed enjoyment categories).

GREEN ISLAND REEF RESORT GUESTS

6.5 Effects of Seaplane and Boat Operations

Analysis of the questionnaire responses from guests is more difficult because of the different periods that each guest could have been resident on Green Island. The 71 guests who satisfactorily completed questionnaires (see TABLE 4.3) were generally from overseas (38%) or interstate (45%) with only a

small proportion (10%) from Cairns and District. Only 17 respondent guests returned to Cairns on the first day of the survey (Saturday) and the remaining 54 would have been on Green Island for either or both of the days of high or medium seaplane activity. The results presented below are for the latter subgroup only.

Nearly all guests reported that they noticed seaplanes coming and going (94%) and boats coming or going (89%). Only a very small proportion reported that either seaplane or boat activity decreased the enjoyment of their visit to Green Island, with considerably more (approximately a quarter in each case) reporting that seaplanes and boats increased enjoyment of their visit. These responses are shown in TABLE 6.5.

TABLE 6.5

EFFECT OF SEAPLANE AND BOAT OPERATIONS ON GUEST ENJOYMENT
(Numbers of guests and row percentages shown)

	INCREASED YOUR ENJOYMENT		DID NOT AFFECT YOU	DECREASED YOUR ENJOYMENT		
	a lot	a little		a little	a lot	
seaplanes	5 (9%)	11 (20%)	36 (67%)	1 (2%)	0 (0%)	54 (100%)
boats	4 (7%)	10 (19%)	33 (61%)	4 (7%)	0 (0%)	54 (100%)

Boat and seaplane operations quite clearly do not detract from guests' experience of their visit. However this conclusion must have a caveat. In the current study nearly all seaplane activity occurred during the hours when the island was host to a large number of day visitors. Given that the whole nature of the island

experience changes after the departure of the day visitors, it is possible that guests might react quite differently to seaplane movements at different periods of the day. In other words, the present result should not be extrapolated to a situation where seaplanes operated outside the period when day visitors are present.

SEAPLANE OPERATIONS, SWIMMERS AND BEACH USERS

7.1 Introduction

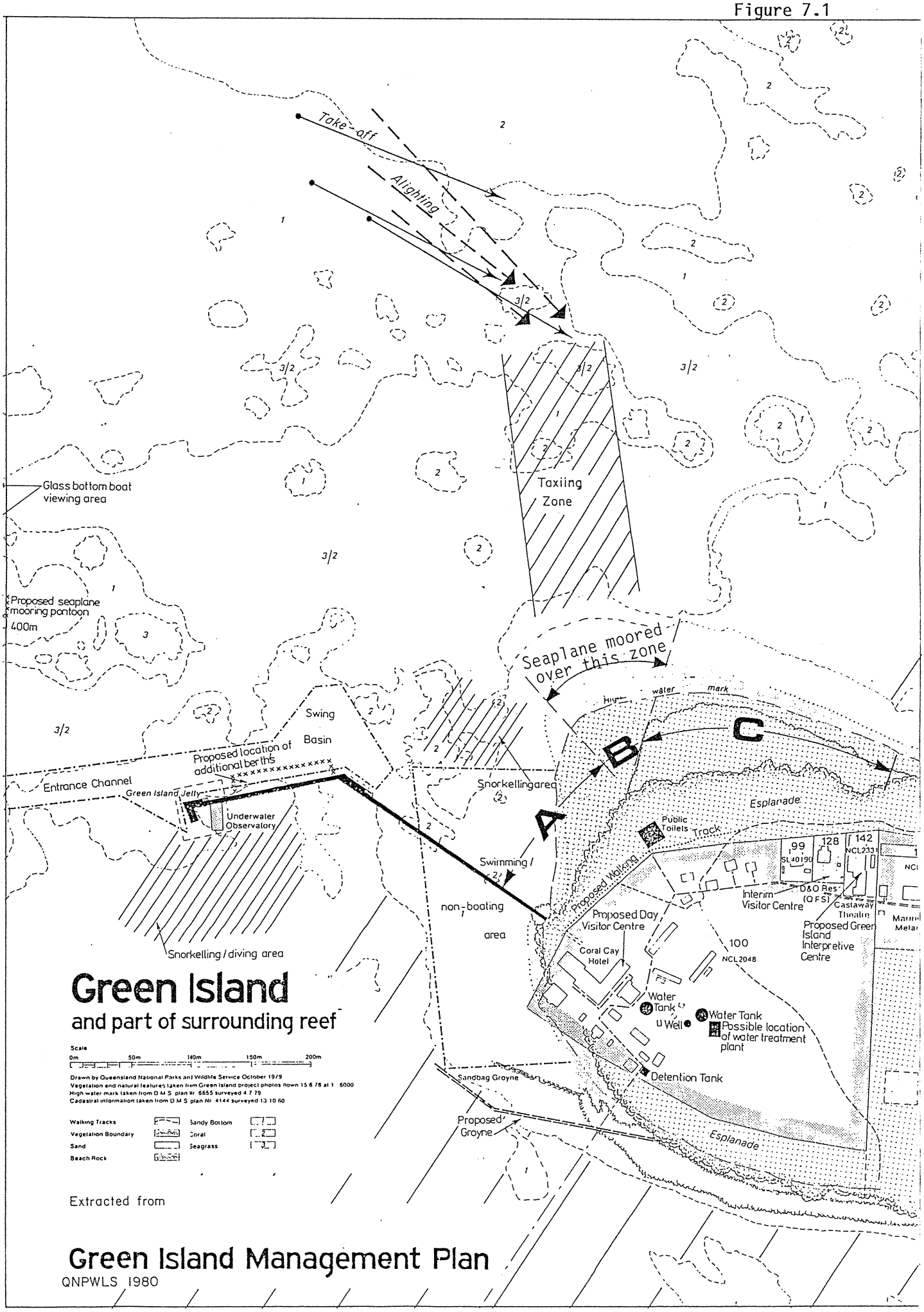
On Sunday 11 May and Monday 12 May, observations were made of the approximate location of seaplane alighting and take off operations at Green Island, the taxi path into the beach and the mooring positions. Observations were also made of the number and location of beach users in the vicinity of seaplane operations, the number of boats moored in the area, and the conflicts that occurred as the seaplane approached the beach.

(It must be stressed that these observations were made on the movements of only one aircraft, with the same pilot, for one wind direction, and that the pilot was aware a study of seaplane operations was in progress. While the observed operations are quite probably typical of those of seaplanes at Green Island, constrained as they are by prevailing wind direction, depth of water and suitable beach access, this study provided no opportunity to observe if and what alternative operations may occur.)

7.2 Alighting, Take-off and Taxiing

The wind direction during the study was predominantly south-east and ranged from 5 to 15 knots. Approximate positions of three take-off and three alighting runs, obtained by compass triangulation from the island, are shown in Figure 7.1. All runs were made into the wind, on a bearing ranging from 120 to 135 degrees (roughly parallel to the landward leg of the jetty) and at a perpendicular distance from the landward leg of about 300 metres. The approximate path used by the seaplane in taxiing to and from the beach is also shown on Figure 7.1. Taxiing speeds

Figure 7.1



Green Island

and part of surrounding reef

Scale
0m 50m 100m 150m 200m

Drawn by Queensland National Parks and Wildlife Service October 1979
Vegetation and natural features taken from Green Island project photos flown 15 6 78 at 1 : 6000
High water mark taken from D M S plan Nr 6655 surveyed 4 7 79
Cadastral information taken from D M S plan Nr 4144 surveyed 13 10 60

Walking Tracks
Vegetation Boundary
Sand
Beach Rock
Sandy Bottom
Coral
Seagrass

Extracted from

Green Island Management Plan

QNPWLS 1980

were low and the aircraft was barely audible from the beach. On final approach to the beach the pilot cuts the engine and the seaplane drifts, head in, to shallow water where the pilot can alight and run out the anchor line to the beach. The position of anchoring the seaplane on the beach depends on the presence of other boats anchored or beached, and on the height of the tide. Only at high tides can the seaplane anchor at the eastern end of the mooring zone indicated on Figure 7.1. Photographs of manoeuvres near the beach and of take-off are shown in Figure 7.2.

7.3 Conflicts with Swimmers and Beach Users.

Conflicts occur as the seaplane approaches and departs from the beach, and to a lesser extent while taxiing to and from the area for take-off and alighting. Swimmers and snorkellers occasionally have to get out of the path of the seaplane, and people wading or walking at the edge of the beach are initially startled and then have to move from where the seaplane intends to beach. People supervising young children appear to be particularly concerned, often moving quickly to restrain them until the seaplane is anchored. While the seaplane approaches the beach at very low speed, its noise, exposed propeller and obvious lack of manoeuvreability contribute to a considerable uneasiness amongst those in the immediate vicinity. The following conflicts in which a swimmer or beach user had to physically move out of the way of the seaplane, or vice versa, were monitored on two days of the study.

On Sunday 11 May, conflicts were noted on 40% of the 20 arrival or departure movements observed:

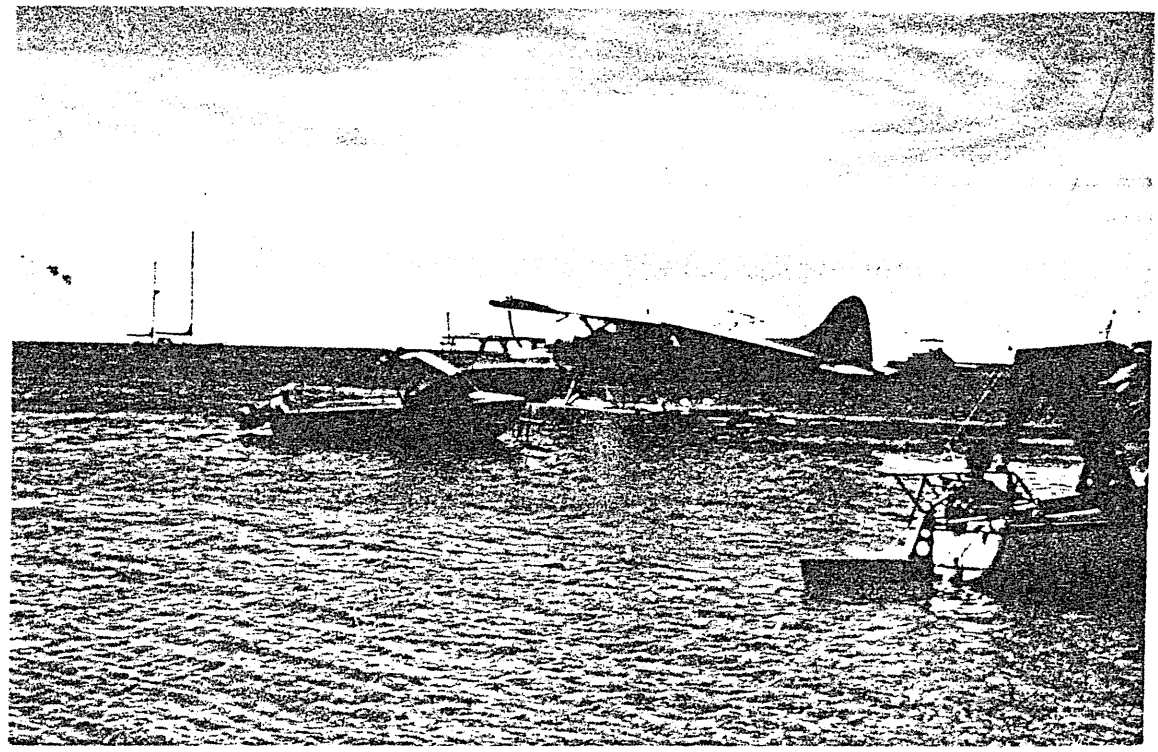
1235 arrival	2 snorkellers, 1 child
1300 arrival	family of 3 in water
1330 arrival	2 snorkellers and family of 3
1420 arrival	family of 4
1430 arrival	family of 3 + 1 elderly person
1435 depart.	1 snorkeller
1445 arrival	1 middle aged swimmer + 1 yacht
1445 arrival	3 swimmers, 1 child wading, 1 power boat.

On Monday 12 May conflicts were noted on 42% of the 12 arrival and departure movements observed:

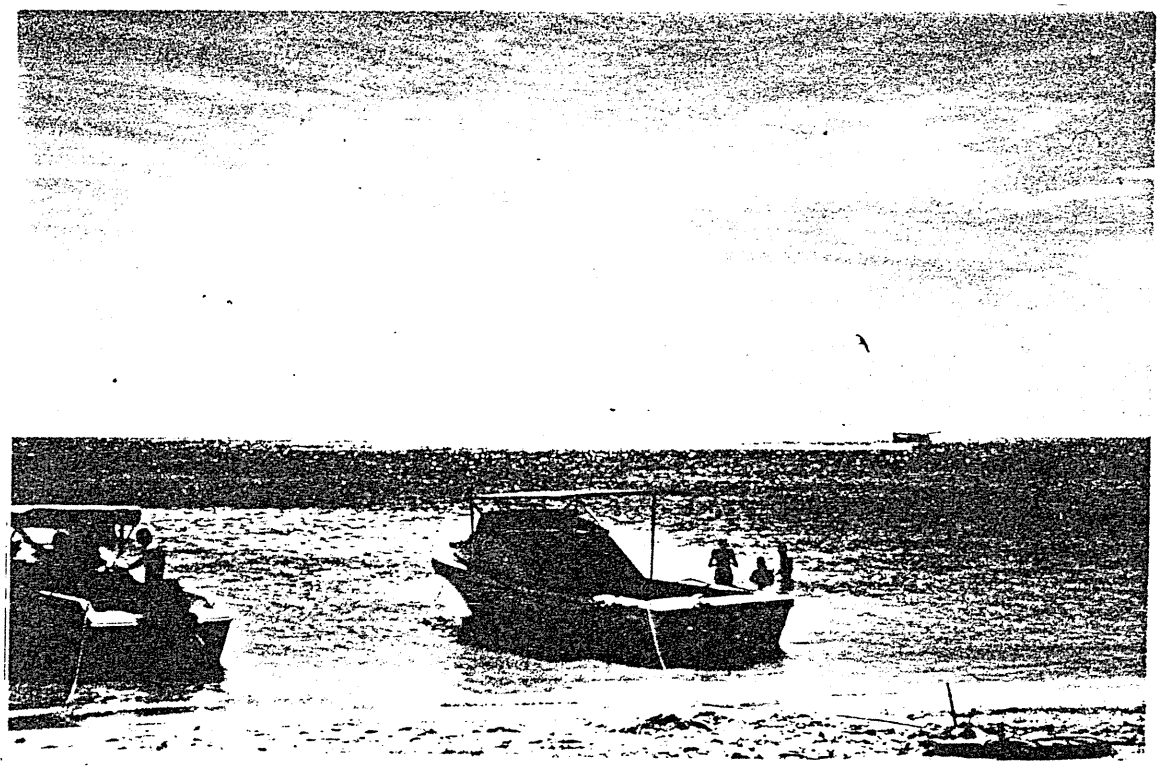
1125 arrival	8 snorkellers
1225 arrival	1 snorkeller
1315 arrival	2 swimmers
1425 departure	4 swimmers
1450 departure	2 swimmers.

In many cases it is possible that these these conflicts would have been regarded as no more than minor inconveniences, though perusal of visitor comments about seaplanes (Appendix A) indicates that many visitors were aware of the potential danger of such conflicts. The risk of a serious incident is quite high.

The possibility also exists of a serious incident occurring where a swimmer is a long way from the shore and in the direct path of a seaplane landing or taking off. On the final stage of an approach the pilot has a very restricted view and would not be able to see a snorkeller or a diver who had just returned to the surface in the path of the seaplane. No such incidents were observed during the study, and in fact no swimmers were observed to venture so far from the shore in the area in which the alighting and take-off movements occurred. It is probable that the risk of a conflict on take-off and landing is relatively low compared to that which exists at the water's edge. Physical



Seaplane manoeuvring through boats at anchor near the beach off Section B (Figure 7.1)



Seaplane taking off approximately 300m from the beach.
Viewed from Section B (Figure 7.1) of the beach.

Conflicts of boats, seaplanes and beach users on Section B (Figure 7.1) of the beach at Green Island. Visitor interest in seaplane activity (and boating activity) is noticeable.

separation of people and seaplane movements, both at the water's edge and in the water in the immediate vicinity of the shore, appears to be the only way to prevent conflicts from occurring.

7.4 Seaplanes and Boats

The problem of conflicts arising from seaplane access to the shore is compounded, and inextricable, from use of the shoreline and beach by private boats. These boats, both power and sail, either anchor close to the shore or at the water line with anchor lines positioned further up the beach (see Figure 7.3). Because private boats visiting Green Island would generally be owned by people from Cairns and District, they would presumably be present in large numbers only on weekends and public holidays - and in the present study the largest numbers occurred on Sunday. The private boats use of the beach constricts access to the waters edge both for beach users and seaplanes, considerably increasing the potential for conflicts. On the days when few private boats were present, the seaplane had a greater choice in where to beach and consequently was able to attempt to avoid coming in close proximity to people in the water or on the beach.

Perusal of visitor's comments on boating activity in Appendix B shows, not only that some visitors were also concerned about the potential dangers of conflicts between boats and swimmers but that a considerable number commented on the unfair competition for beach and water's edge between the boats and other beach users. There were 25 boats (other than ferries) anchored or beached at Green Island for most of the day on Sunday 11 May, but only 6 on Monday 12 May. Both figures include the glass bottom boats and several yachts "permanently" present. The numbers of

people either using the beach or swimming near the beach were also recorded over these two days and are shown in TABLE 7.1. They are reported for the different sections of the beach shown in Figure 7.1.

TABLE 7.1

NUMBERS OF PEOPLE OBSERVED USING THE BEACH AND SWIMMING

SEE FIGURE 7.1 FOR THE LOCATION OF SECTIONS A B & C OF THE BEACH

	SECTION A		SECTION B		SECTION C		TOTAL
TIME	On Beach	In Water	On Beach	In Water	On Beach	In Water	(percent in Section B)
Sunday 11 May							
1230	62	18	30	9	90	20	229 (17%)
1330	90	29	58	8	50	19	248 (27%)
1430	21	2	27	8	28	21	107 (33%)
1500	25	1	28	6	31	10	101 (34%)
Monday 12 May							
1100	21	15	33	4	22	17	112 (33%)
1200	19	8	22	14	31	10	104 (35%)
1300	44	22	31	7	20	10	134 (28%)
1400	33	20	23	5	36	4	123 (23%)
1500	28	7	9	7	10	0	61 (26%)

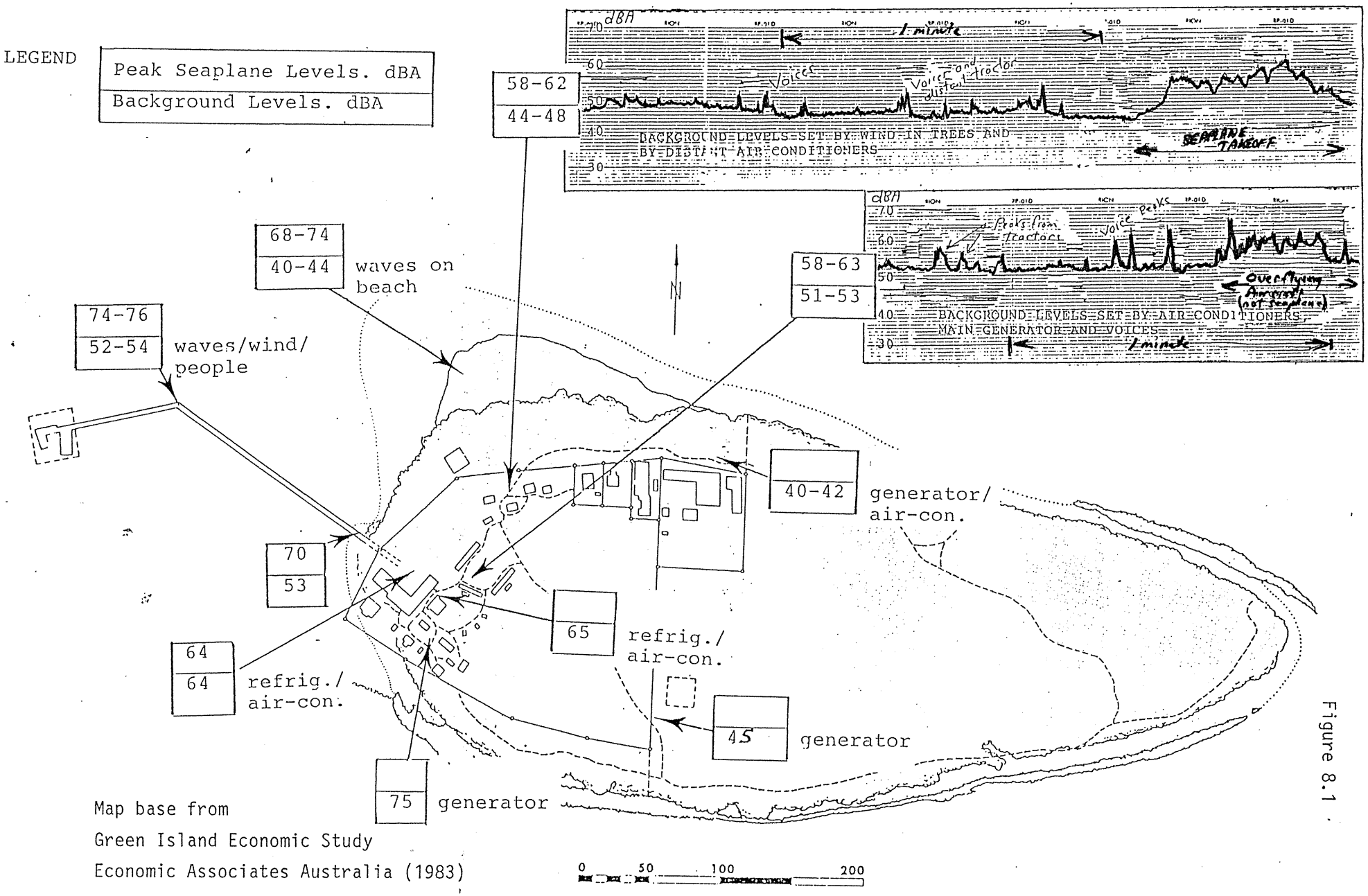
Section B is that arc of the foreshore over which the seaplane was observed to anchor and it can be seen from the table that it is a heavily used section of the beach. Conflicts with seaplanes and boats are inevitable.

NOISE FROM SEAPLANE OPERATIONS

8.1 Background Noise Levels

Spot noise level measurements were taken at various points around Green Island to obtain the daytime background levels against which intruding levels of seaplane noise could be assessed. The intrusiveness of a new noise source can, in part, be assessed by the excess of the new noise over the existing background. The results are shown in Figure 8.1. At many of these locations, peak levels of noise made by the seaplane - always occurring during take-off - were also recorded and these are shown on the Figure. Chart records of noise levels were also made at several locations and short extracts are shown.

Existing background levels of noise on Green Island vary significantly across the island. On the jetty and around the beaches, background noise levels during the daytime were set by wave and wind noises. Levels were generally around 40 dBA, but much higher on the exposed jetty. Away from the beaches the levels were set primarily by machinery noise (airconditioners, refrigerator units and similar in many areas near the Resort) with the island generator dominating in any location not near to these localized sources. In much of the area used by visitors, other than the beaches and the National Park, the background levels are rather high, generally not being less than 50 to 60 dBA. Superimposed on these backgrounds are voices and noise from movement, particularly that of the tractors used in the resort. Tractor levels of up to 80 dBA were measured when these passed close by the measurement sites, but these were only of short



Map base from
Green Island Economic Study
Economic Associates Australia (1983)

Figure 8.1

duration - generally 15 seconds or less.

8.1 Seaplane Noise

Alighting movements by seaplanes were practically inaudible, as was taxiing at low speed. However, on departure, seaplane noise was significant when the seaplane first started up at the beach and again on take-off. Start-up noise was likely to startle beach users, but the study team were often unable to detect start-up noise at other locations on the island. Levels of noise during takeoff tended to be 10 to 20 dBA above background levels for about 25 seconds (twice to four times as loud as the background) depending on the observer's location on the island. On the north-west beach and jetty, where background levels were low and there was direct line-of-sight to the take-off, the seaplane noise was certainly very noticeable. However, at other locations on the island seaplane noise was far less intrusive as a result of both extra attenuation of aircraft levels and the higher background levels. For example, take-off noise was barely audible in the outdoor restaurant area of the resort. Further, the presence of other intrusive noises (tractors and voices) reduced the likelihood that seaplane noise would be regarded as excessively intrusive.

Aircraft other than seaplanes also pass quite close to the island and the noise made by one of these was recorded by the study team. The chart of its passage is marked in Figure 8.1.

In summary, if all seaplane movements at Green Island were similar to those observed in this study, the noise generated on take-off would certainly be noticeable for beach users, and

perhaps even regarded by some as intrusive (visitors' comments on seaplane noise in Appendix A confirm this) but, over much of the rest of the island, relatively high background and transient peak levels set by mechanical sources significantly reduce the noticeability of the take-off noise levels. Landing and taxiing noises are barely audible. The caveat to these conclusions again relate to the fact that these observations were made on only one aircraft type and only during the hours of peak visitor use of the island. Despite this, other types of seaplanes would have to emit significantly higher levels before these conclusions would alter.

ACKNOWLEDGEMENTS

The pilot of Aquaflight Airways Pty Ltd, Mr David Presnell, provided every possible assistance in this study. His co-operative and friendly assistance is greatly appreciated. The management and staff of Hayles Holdings Pty Ltd, Coral Seatel Pty Ltd and Green Island Reef Resort also assisted in every way possible, and the study could not have been completed without their permission to survey on the ferries and in the Resort. Ross Mathers and Charlotte Mathers provided extensive assistance in the field and together with Frank Vanclay, Tor Hundloe, Sally Driml, Tuki Brown and Ian Gray, assisted in the visitor survey. Queensland National Parks and Wildlife Service provided assistance in transportation and loan of equipment. All is gratefully acknowledged.

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ECONOMICS ASSOCIATES AUSTRALIA (1983) Green Island Economic Study Great Barrier Reef Marine Park Authority.

GREAT BARRIER REEF MARINE PARK AUTHORITY (1983) Cairns Section Zoning Plan and the Cormorant Pass Section Zoning Plan.

RESPONDENTS COMMENTS ON SEAPLANE ACTIVITY

The following are comments volunteered by respondents on the space provided on the questionnaire. They have been grouped according to an earlier response as to whether "seaplanes coming and going" decreased their enjoyment, increased their enjoyment or did not affect them. The day the respondent visited Green Island is also shown: there was low seaplane activity on Saturday, high seaplane activty on Sunday and medium seaplane activity on Monday.

"INCREASED YOUR ENJOYMENT A LOT"

(Saturday 10 May - LOW seaplane activity)

-Interesting to watch.

-More of them!

-We saw one land which was exciting, as I've never seen one before.

-Having never seen one land before, I thought it fun to watch.

(Sunday 11 May - HIGH seaplane activity)

-Add entertainment.

-Only use as entertainment for children, noise pollution.

-A good idea.

-Too many take offs and landings.

-Saw one, it added to the scenery.

-Why did it take off and land several times?

(Monday 12 May - MEDIUM seaplane activity)

-More.

-A most enjoyable way to see total aspect of reef.

-Interesting to watch.

-Beaut to see the seaplanes.

-More of them at reasonable prices - best way to see reef on a broad scale.

"INCREASED YOUR ENJOYMENT A LOT" (contd)

-Seaplanes were interesting to watch.

-Should be given a chance to go on them.

-Interesting.

-Only saw one - should be more, they would enable a better view of the overall size and layout of the reef.

"INCREASED YOUR ENJOYMENT A LITTLE"

(Saturday 10 May - LOW seaplane activity)

-An unusual attraction.

-Interesting because I don't see them often.

-Only saw one.

-As with boats, and also some curiosity value. (Boat comment: The boats provided a pleasant scenic backdrop.)

-First time I've ever seen landing - attractive to see once, but not more.

-Pleasant to see.

-I was interested in the take-off and landing.

-Always an added attraction.

-It was exciting seeing the planes land and take-off.

-The seaplane was an interesting diversion.

-Good to see.

-Good. (I saw one.)

-Need own area for loading and unloading, away from swimmers.

(Sunday 11 May - HIGH seaplane activity)

-No safety precautions visable.

-Loud.

-A bit noisy at times.

-Some control as crowds and boat numbers increase.

"INCREASED YOUR ENJOYMENT A LITTLE" (contd)

-Too frequent

-Good to watch.

-Good to watch.

-Children most interested as not seen one before.

-One only landing.

-Cool.

-Pleasant to see on occasions.

-Adds a little visual stimulation (don't notice after a while).

(Monday 12 May - MEDIUM seaplane activity)

-Good to watch.

-First time seen, but should be an attraction for tourists.

-Took an interest in their coming and going.

-Lovely to watch.

-Enjoyed seeing it come and go.

-Watching the only seaplane flying today was a pleasant experience for me.

-Seemed a short flight, would like to have known how much and cost.

-A novelty.

-Good to see.

-Added to atmosphere.

-One seaplane.

-Became annoying after a while.

-Good to see.

-A feature!

"DID NOT AFFECT YOU"

(Saturday 10 May - LOW seaplane activity)

-Looked shit-hot.

-Add to the 'mystique' of a tropical 'hide-a-way'.

-Only one.

-A bit noisy.

-I enjoyed watching them take-off and land.

-Another way of getting to the island.

-Acceptable activity - no noise or fuss.

-I like to watch them.

-Not noticed.

-There should be a specified area for it to land instead of right in the middle of swimmers.

-Wish I could have hopped aboard.

-Different.

-Interesting.

-They're O.K.

-One only thank goodness - but it was a lovely sight.

-Added to the attraction of the beach.

-Nice to see.

-Very enjoyable. Don't have them in Sydney.

-Entertainment.

-Good show attraction.

-Shouldn't go near the bird sanctuary.

-Only saw one.

-Scenic flights if possible.

(Sunday 11 May - HIGH seaplane activity)

-Could cause problems for bird life.

-Only saw them flying.

"DID NOT AFFECT YOU" (contd)

-Enjoy watching them take off.

-Scenic.

-Pilots and snorkellers need to watch out for each other.

-Not a worry.

-Noise pollution.

-Seemed part of the attraction of the place.

-One seaplane kept landing and taking off about 3 times during the four hours. I suggest putting a restriction on small boats and sea planes.

-Noisy.

-Not enough to be objectionable.

-Not more.

(Monday 12 May - MEDIUM seaplane activity)

-Would not like to see the seaplanes visit frequently - spoils the tranquility.

-No problem - also confined to one area.

-Access be made easier.

-Landing and taking off add to attraction.

-Enjoyed watching them.

-No problem.

-Would have enjoyed seeing one.

-Good to watch.

-Like to see more of them.

-A rare sight these days. therefore a novelty.

-Good fun.

-Only one, and it was interesting to see.

-No problem.

-Great.

"DECREASED YOUR ENJOYMENT A LITTLE"

(Saturday 10 May - LOW seaplane activity)

-Came right into where myself and my daughter (2 1/2 years old) were 'swimming' (sitting in the water). They should have their own area for 'parking' (clearly marked).

-Some got quite close when taking off.

-Only one or two - no problem.

-The seaplane took off too close to the moored boats.

-Should only be given permission to land and take-off 400m further out than where they did so - further away from the island.

-Wildlife authority conducting test.

-I hate seaplanes and speedboats - they belong in entertainment venues, not National Parks.

(Sunday 11 May - HIGH seaplane activity

-I don't think the seaplane should come to the beach, it's too noisy.

-They scare all the fish away when you are hand feeding them.

-Too close to the swimming area, should be no closer then 50 metres from beach area.

-Don't let them come!

-Operating too near swimming area.

-Noise pollution.

-Didn't bother me too much, very frequent though.

-Zones needed.

-Dangerous whilst snorkeling.

-Too noisy.

-Moored at least 50 metres from shore, and transport to shore.

-Take offs every half hour. Once was interesting but twelve times was noisy.

-Planes may be able to take off from some areas other than the front of the beach.

"DECREASED YOUR ENJOYMENT A LITTLE" (contd)

(Monday 12 May - MEDIUM seaplane activity)

-Could be dangerous taking off in swimming area.

-There was one seaplane on the beach.

-The seaplanes start too often.

-I only saw one, and it was a point of interest, not a concern.

"DECREASED YOUR ENJOYMENT A LOT"

(Saturday 10 May - LOW seaplane activity)

-Should only be allowed to take-off well away from island and cays, and not over them.

-Noisy, dominating beach scene when present. Seaplane uses the only part of the beach which swimmers can use at low tide when it comes up the beach - very disturbing.

-Ban them.

(Sunday 11 May - HIGH seaplane activity)

-Noise, pollution,and swimming hazard.

-A hazard to children swimming and pollution of fuel and noise.

-The plane was coming too close to the swimmers.

-Too noisy, spoiling atmosphere.

-Absolutely hated the noise, certainly out of place at such a beautiful place.

-Makes too much noise, nearly got run over by one.

-Contributes noise pollution and limits swimming freedom.

-Should be managed for certain types of activities.

RESPONDENTS COMMENTS ON BOATING ACTIVITY

The following are comments volunteered by respondents on the space provided on the questionnaire. They have been grouped according to an earlier response as to whether "boats coming and going" decreased their enjoyment, increased their enjoyment or did not affect them. The definition of "boats" was deliberately left ambiguous, but it is quite clear in most of the responses whether the comment refers to the ferry boats or the private boats at Green Island. The day the respondent visited Green Island is also shown: all days had a similar level of ferry activity but private boating activity was much greater on the Sunday.

"INCREASED YOUR ENJOYMENT A LOT"

(Saturday 10 May)

-I like boats.

-Have more boats scheduled. One gets stuck on Green Island for too long if not a water person.

(Sunday 11 May)

-We met people on one - they cause no harm. Alot of joy for people.

-Lovely.

-They add a great deal to the visual aspect of the island.

-O.K.

-Good to see a wide variety of sailing and power boats.

-Should not be beached for maintainance on the island.

-Glass bottom - a bit dangerous around snorkellers.

-Good to see.

-Saw a few.

-Our boat was great.

-Boat great.

(Monday 12 May)

-The cats were smooth running, lessening the number of sick.

-Queues for boarding to outer reef vessel were badly conducted

"INCREASED YOUR ENJOYMENT A LITTLE"

(Saturday 10 May)

-The 'big cats' are interesting to watch.

-Attracted many fish at the end of the pier by turning up the sand.

-Nil area for mooring of small craft.

-Interesting watching boats come and go.

-Enjoyed a lot.

-Sail boats were beautiful.

-Sail boats added to scene.

-I like the boats, they make the island seem alive ie. not desolate.

-Can they see snorkels, or may they run them over?

-Good to see.

-Need more boats scheduled from Green Island for non-water people.

(Sunday 11 May)

-Provide for visiting power boats and yachts.

-Number should be controlled.

-Area where boats moor - too wide an area.

-Caused some problem while snorkelling.

-Good beaches to anchor at, calm water.

-No overcrowding.

-Good to see attractions available to small craft.

(Monday 12 May)

-Nice to see variety of boats.

-Good tour service.

-Extremely rough.

-Enjoyable to and from island.

-Did not worry me.

"INCREASED YOUR ENJOYMENT A LITTLE" (contd.)

-Small ferry, had too much enclosure.

-Expected.

-Added to generally pleasant atmosphere.

-Added to atmosphere.

-Excellent chance to view reef.

"DID NOT AFFECT YOU"

(Saturday 10 May)

-I think it's good to see yachts, boats etc over here.

-Nowhere in particular to go, even amongst swimmers.

-There must be some boats allowed on the island, and they're only entering from the jetty.

-Nice that people can make it under their own steam.

-Acceptable part of island activity.

-I felt safe snorkeling without speedboats and waterskiers etc around (great).

-Disturb the fish and other marine life.

-The boats provided a pleasant scenic backdrop.

-No problems.

-Took it for granted.

-The large boats.

-Well positioned so they did not effect swimming areas.

-Add to tranquility of place.

-Pleasant to see.

-Are necessary.

-No worry.

-Big cat too slow.

-Nothing can be done!

"DID NOT AFFECT YOU" (contd)

-Always an added attraction as they come and go in every port.

-Can't be helped.

-Not much noise from them.

-Quiet.

-My concern if any is for the marine life.

-The boats add to the ambience of the island.

-Excess should be stopped going over reef.

-Sometimes created snorkeling hazard.

-Too many, too noisy.

-A boat going back later at night - 7.30 p.m.

(Sunday 11 May)

-Better restrictions on mooring, because they restrict swimming space.

-Too many on the beach where you swim.

-Large numbers of boats in small areas must cause many problems for marine life.

-Stayed on board or swam - no boats near.

-Should have certain places, not where swimmers are.

-Could be asked to moor a little further out so that the beach was not covered with ropes.

- Adds atmosphere.

-Not bad.

-There were only a few and they didn't seem to be in anyone's way.

-Area where boats moor - too wide an area.

-Zones needed.

-Rather haphazardly moored.

-Glass bottom boats - very enjoyable.

-Glass bottom boat - good.

-Comfortable.

"DID NOT AFFECT YOU" (contd)

-No problem.

-No problem; gives atmosphere.

-No affect.

-Too many actually anchoring on the beach instead of 50 metres off.

-Necessary I suppose.

(Monday 12 May)

-Did not worry me, nice to see different types.

-Always needed.

-Quite rough.

-No problems, all basically go to same area.

-A necessity to get people there and back, but probably could pollute the reef.

-Would not like to see any more, because then the island would become a "Coney Island".

-Part of the attraction.

-Restricted entry.

-Everywhere!

-Govern their movements.

-Necessity.

-Normal boat traffic.

-O.K.

-Yachts anchored at island aesthetically pleasing.

-Great service and hospitality.

-Great service and hospitality.

-No problem.

-Add to the attraction.

-Should be kept away from snorkellers.

"DECREASED YOUR ENJOYMENT A LITTLE"

(Saturday 10 May)

-A bit of a distraction, and shouldn't be so close to the coral.

-Well controlled.

-See airplanes. (Seaplanes comment: Should only be given permission to land and take-off 400m further out than where they did so - further away from island.)

-Too commercial - broken coral (anchors) on reef.

(Sunday 11 May)

-Too close to shore, scattered, where they decided to moor.

-Too many in close where people were swimming.

-Too many operating near swimming beach.

-Should be an area set aside.

-Too close to swimmers.

-It would be nice to have the boats some place other than at the swimming beach.

-Speed boats shouldn't be allowed near swimmers.

-Swimming area on beach where boats can't anchor.

-Should have designated areas for the docking of boats.

-Bit worried about not being seen whilst snorkelling.

-Drinking and then going home, no life-jackets on!

-A lot of people were drinking all day and then going home. More boat safety awareness needed.

-A nuisance on beach - take up too much swimming room.

-Too many boats, but don't see how it can be avoided.

(Monday 12 May)

-Concerned for people snorkelling, although did not see any problems (near misses).

-On my last visit (4 weeks ago) was aware of motorboats being too close to swimmers and snorkellers.

"DECREASED YOUR ENJOYMENT A LOT"

(Saturday 10 May)

-To be anchored at specific locations.

-To be kept controlled.

(Sunday 11 May)

-Require much more supervision.

-Need supervision of their coming and going.

-Too many too close. Trendy activity in Cairns.

-Boat pulled right up onto beach, tripping over anchors and ropes.

-Too many on the beach.

-Much too close to swimming area.

-Should not be moored on or near beach for safety of swimmers.

-Boats should be moored at least 50 metres from shore.