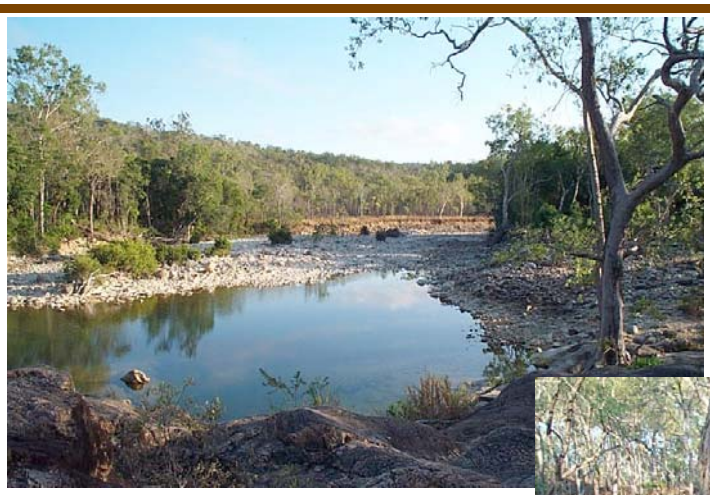
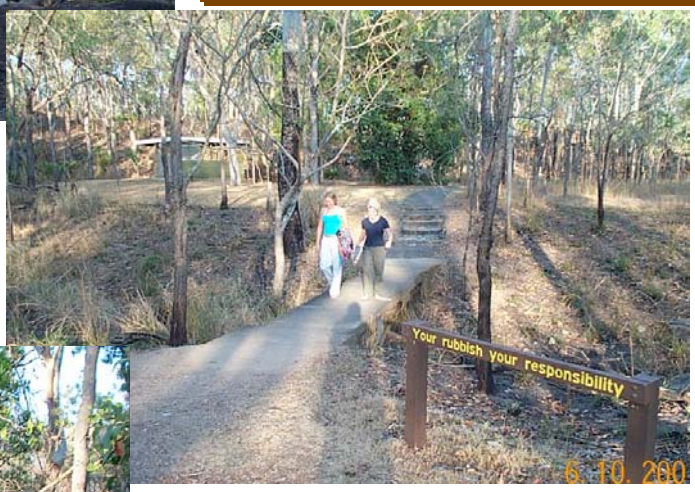
Big Crystal Creek

Site Level Data Report

2001/2002





Joan M Bentrupperbäumer

Rainforest CRC

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For this research:
- James Cook University Ethics Approval No. H1272
- Queensland National Parks & Wildlife Service Permit No. FNQ06
- Wet Tropics Management Authority Contract No. 654

Terms of Reference

Visitor Use Survey

The following Terms of Reference have been extracted directly from the WTMA/Rainforest CRC Contract document.

Background

Measurement of visitation to the WTWHA extends far beyond the estimation of visitor numbers. The collection of basic visitor numbers provides baseline information only. Further visitor specific information is required to provide managers with an understanding of patterns of visitor use, behaviour, perceptions, attitudes, expectations and satisfaction. A comprehensive understanding of these visitor aspects is critical to effective visitor management including minimisation of biophysical impacts and maximising benefits to the land manager, visitor and community.

WTMA commissioned Manidis Roberts Consultants in 1993 to conduct an extensive visitor survey with the aim of providing baseline information for comparison with future visitor use surveys. The Manidis Roberts 1993/1994 visitor survey was conducted over 56 sites and although not comprehensive provided an important first step in visitor monitoring within the WTWHA. The MR survey approach include 3 key elements:

- traffic counts
- site observations
- visitor interviews

A number of subsequent visitor use surveys have taken place throughout the WTWHA, and although they have not taken place in as many sites as the Manidis Roberts 1993/1994 survey, they have been far more comprehensive and complex in order to investigate the variety and complexity of issues identified by management agencies.

Aims:

- To collect, compare and review site-based visitor information against previous survey exercises, including aspects of the MR survey
- To update WTMA's visitor survey system to achieve improved administrative efficiency and capture of key site-based visitor information which will aid land managers and the tourism industry in making informed management decisions
- To contribute to measuring psychosocial indicators for State of Wet Tropics reporting processes
- To provide an integral input or tool for the 'Visitor Monitoring System (VMS) for the Wet Tropics World Heritage Area', a project which is also being undertaken by Rainforest CRC during 2001 to 2002.

(Ref: *WTMA Contract # 654 , 2001*)

About the Author

Dr Joan M Bentrupperbäumer is a Senior Research Fellow and Project Leader with the Rainforest CRC and Lecturer at TESAG and the School of Psychology, James Cook University, Cairns. Her research interests include human-natural environment transactions using social, psychological and biophysical perspectives. Her research approach incorporates an interdisciplinary perspective on reciprocal relationships indigenous and nonindigenous people have with the natural/built/social/cultural environment in the WTWHA and the implications of such relationships for environmental management, tourism and local communities in the region. A particular emphasis in the research is placed on the 'real world' application of results in terms of planning for, managing, monitoring and reporting on the State of the Wet Tropics, and developing practical mechanisms and strategies to mitigate impacts on those features of the WTWHA inherent to its World Heritage status.

Acknowledgments

The success of this research project, which was undertaken across ten sites within the Wet Tropics World Heritage Area, has very much depended on the many people involved in various research related tasks. In particular I would like to acknowledge my colleague Dr Joseph Reser who has worked together with me over a number of years now developing and refining the analytical framework, survey instruments, and methodologies for this multidisplinary research on impacts of visitation and use in protected areas. Together we have finalised a report which brings together the results from the ten site level reports, and discusses in detail the analytical framework, methodologies and procedures which were used to undertake this research (Bentrupperbäumer & Reser, 2002a). I would also like to specially acknowledge my research assistant Sue-Ellen O'Farrell who has made a major contribution to this research by assisting me in every aspect of the administration of the project.

In addition I wish to acknowledge all of those listed below who were involved in various aspects of this research.

A. Data Processors
Bronwyn Guy, Joshua Guy, Charmayne Paul, Sue-Ellen O'Farrell, Lucas Talbot, Sunny Pegararo and Jenny Butler.

B. Field Assistants across the region
Kristie Ashden, Rosanna Brown, Shannon Bros, Megan Campbell, Margit Cianelli, Campbell Clarke, Laurel Cooper, Cheryl Cornelius, Leyla Demis, Mathew Earle, Heidi Freiburger, Malcolm Frost, Michelle George, Paula Gilbard, Bronwyn Guy, Joshua Guy, Kristen Haaland, Alicia Hill, Steve Lawrence, Denise Lievore, Lisa Martin, Rik Morgan, Sue-Ellen O'Farrell, Charmayne Paul, Sunny Pegoraro, Romina Rader, Quinn Ramsden, Hilde Slaatten, Mathew Sutherland, Lucas Talbot, Colin Tonks, Ben Trupperbäumer, Steve Turton, Roger Wilkinson, Robyn Wilson, Cleo Wilson.

C. Field Assistants at Barron Falls
Campbell Clarke (Field Supervisor), Alicia Hill, Mathew Earle, Michelle George,
Rik Morgan (Traffic Counter).

D. Research Colleagues
Dr. Robyn Wilson, Assoc. Prof. Steve Turton and Dr Miriam Goosem.

E. WTMA Personnel
Max Chappell, Campbell Clarke, Dr Steve Goosem and Ellen Weber.

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Table of Contents

This Research

Natural resource managers are increasingly aware that the real issue and challenge for them is people management. In a protected area context this requires an informed understanding of the nature and quality of the interaction between people and environment. The multilayered and multidisciplinary site-level approach applied in this research is one that provides such an understanding and has evolved from, built upon and refined earlier research endeavours (Bentrupperbäumer & Reser 2000). The conceptual and methodological framework which assesses and documents this interactive process and which was applied in this research is outlined in Figure 1. This framework differentiates between four primary research layers or domains, one for each of the four key site-level 'environments' within the setting: *social and psychological (*psychosocial*), natural and built (*physical*)* (Reser & Bentrupperbäumer, 2001). Research projects representative of each of these 'environments' were conducted simultaneously at the site, which provided a comprehensive and realistic context for measuring, monitoring and reporting on the *impacts* of visitation and use at recreational settings in the Wet Tropics World Heritage Area.

From a management perspective, this site-level research approach provides specific site and situation level data which can directly inform site level decision-making and practice, as well as monitoring and reporting (see Site Level Reports #1 to #10, Bentrupperbäumer 2002 a to j). In addition, this site-level sampling allows for an accurate and meaningful aggregate picture of what is happening at a bioregional or World Heritage Area level, as long as data collection sites and data collection are representative (see Report #11, Bentrupperbäumer & Reser 2002a, *WTWHA Bioregional Level Perspective 2002*). Given that reporting on the State of the Wet Tropics is a statutory requirement, the standardised conceptual and methodological framework used across the ten WTWHA sites and the subsequent information provided by research such as this is critical for continued monitoring and reporting change over time.

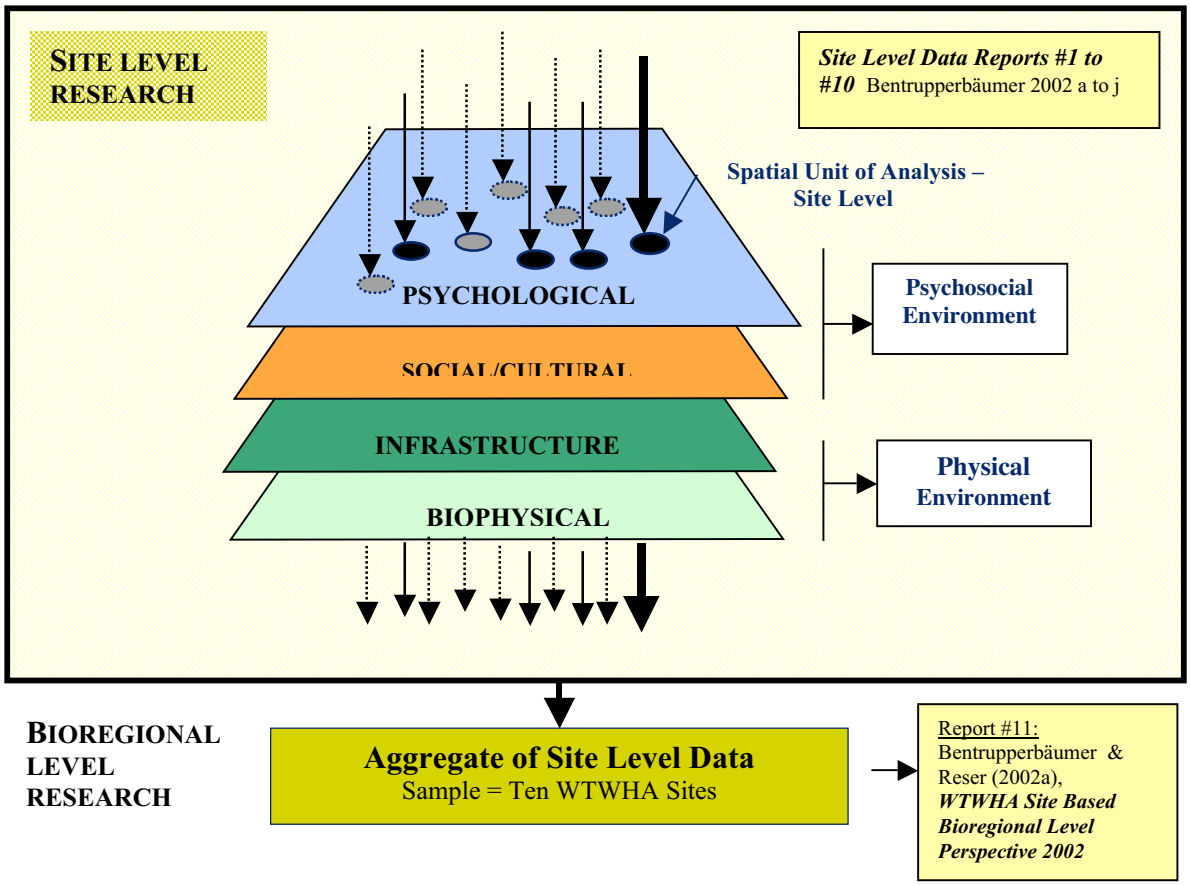


Figure 1: Diagrammatic representation of the research layers, domains and report outputs for this research .

This Report

This report is one of ten site-level reports which presents a comprehensive set of data analyses for the strategic sample of research tasks undertaken across three of the four research domains outlined in Figure 1. The research covered in this report was undertaken at the Queensland Parks and Wildlife Service and Wet Tropics World Heritage site, ***Big Crystal Creek,*** Paluma National Park, during 2001 and 2002. Since the primary objective of this report is to provide key site-level data of relevance to all levels of management, from on-ground to policy, planning, monitoring and reporting, details of methodology are not included here. This information is available in a separate but accompanying report (Report #11, Bentrupperbäumer & Reser, 2002a). When *comparative data* from previous studies are available they are included in each relevant section. When such data is from studies other than the authors, methodology and specific measures are often different. The layout of this report, which compliments the research domains presented in Figure 1, is outlined in Figure 2 and the discussion that follows.

SITE LEVEL REPORT

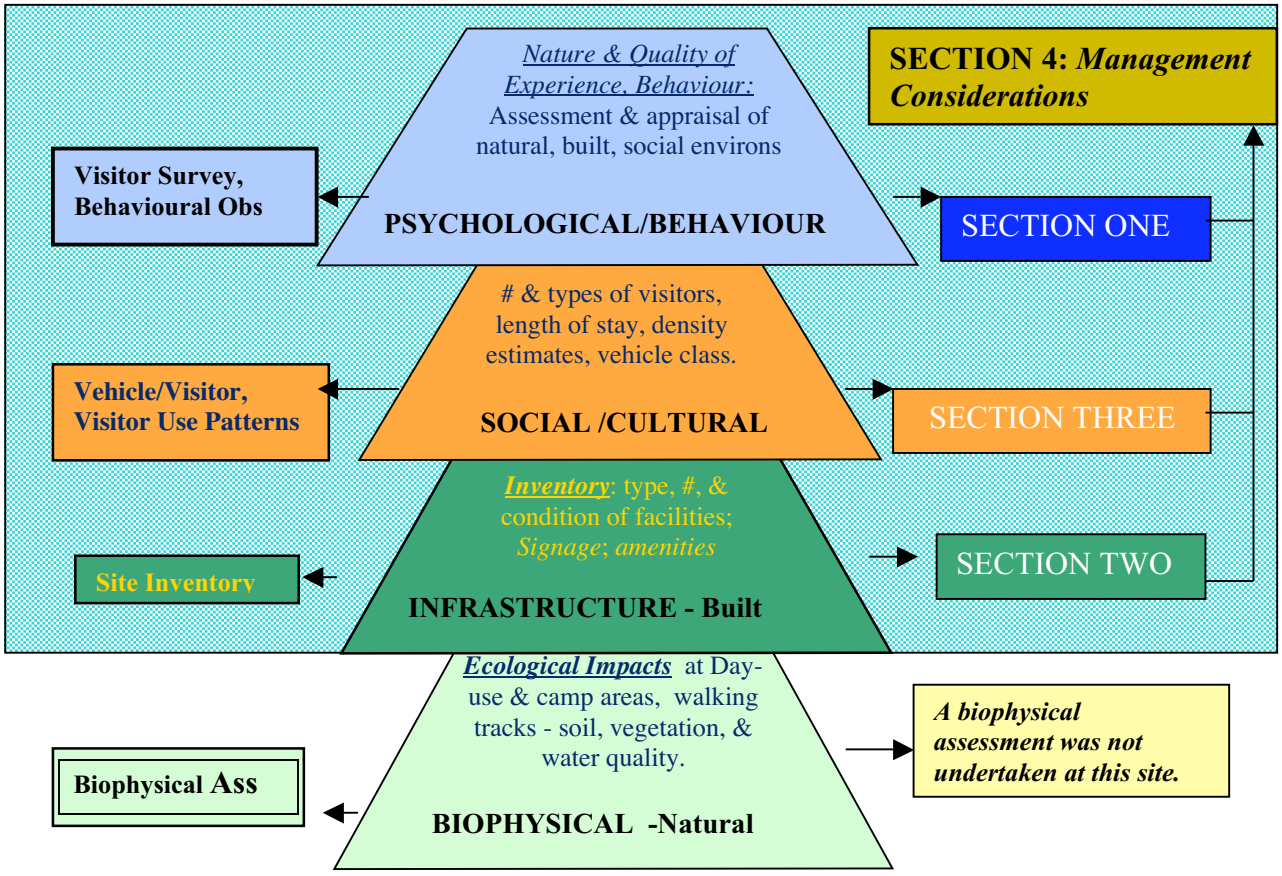


Figure 2: Diagrammatic representation of the report layout and report sections.

The layout of this report is in four sections. The first three sections present data which reflect the strategic sampling across three research domains, while the fourth section addresses key management considerations. The data in this report is presented in some considerable detail the purpose of which is to allow for the identification in future monitoring of changes in the system over time, however subtle. It also provides management agencies with the detail required for State of Environment reporting and planning, policy and on-ground management decision-making.

Data Sections

Section 1: *Psychological and Behavioural*

In the first section, general descriptive analyses of the two stages of data collection undertaken at this site in September, 2001 and April, 2002, are presented. Data collected includes:

a) ***visitor survey*** provides information on visitor profile, reasons for visiting, appraisal of the natural, built, social environment, and signage, visitor activity, prior information sources used, experience and satisfaction. Comparable survey items from Manidis Roberts (1993/1994) are also included.
b) ***behavioural observations***, and
c) ***general comments*** by visitors, field assistants and field supervisors.

Section 2: *Infrastructure/Built Environment*

The second section presents an ***inventory of site facilities and infrastructure***, including all ***signage***, which was undertaken by the author during the same data collection periods. An inventory from previous research (Bentrupperbäumer & Reser 2000) is included for comparison as is signage information from SitePlan (1993).

Section 3: *Social Setting/Visitor Use Patterns*

The third section presents information on the social setting of the site including visitor use patterns. While the research undertaken in this section does not encompass the full meaning of *social*, the information nevertheless provides an overview of visitor use patterns including number and type of visitors accessing the site, length of stay at the site, pattern of use over time, vehicle type, etc. This information was obtained and is presented in two ways.

a) The first is observer-based information which outlines vehicle and visitor data obtained over 4 x 8 hour observation periods during September 2001 and April 2002.
b) The second is instrument-based information obtained from the traffic counter which provides monthly, weekly, daily records of vehicle numbers, and visitor numbers calculated from visitor counts in vehicles and Questionnaire item # 8 in the visitor survey. The traffic counter was installed for a continuous period of 12 months from mid September 2001. Traffic counter data from Manidis Roberts (1993/1994), the WTMA Traffic Counter Program (1993-1997), and Bentrupperbäumer and Reser (2000) are included for comparison.

Integrative Section

Section 4: *Management Considerations*

The fourth section of this report addresses management considerations that have emerged through the integration of the data across the above three research domains. These considerations cover topics such as: presentation, protection, opportunities, problems and issues, threatening processes, layout and design, indicators and monitoring.

Site Location & Description

Big Crystal Creek is situated within the Paluma National Park approximately 65 kilometres north-west of Townsville. Big Crystal is a Wet Tropics World Heritage site and occurs in the south east lowland section of Australia's Wet Tropics of Queensland World Heritage Area (WTWHA), which extends from Cooktown southwards to Paluma, encompassing an area of 894,420 hectares (Figure 3).

Natural Environment

Big Crystal is one of the most southern sites listed in the WTWHA. Typical to this drier area, Big Crystal experiences an annual rainfall of approximately 1,600 mm, this is lower compared to other sites within the bioregion. Temperatures are also lower by approximately 5 – 10 degrees than the coastal sites. The forests within this region are typically made up of a diverse range of eucalypts, and hoop pines. Animals are diverse within this area, especially birds, frogs, lizards, and pythons. Other animals often sited include the Herbert river ringtail possum and tropical Bettong.

Indigenous and Non indigenous Cultural Environment

The area around the Paluma ranges has been traditionally occupied by Wulguru-Kaba people (Ritchie, 1995). There is very little known of the Wulguru-Kaba people, except they were probably nomadic and moved as the seasons changed to make use of natural food supplies (Ritchie, 1995). It is believed that non indigenous contact to the area came around the 1870s, in the form of tin prospectors. In the early 1900s, tin mining peaked, but fell due to low prices and access. McCellands lookout is named after the man who built Paluma road and the bridge across Little Crystal creek (QPWS, 2000).

Built Environment

The Big Crystal site has been designed for day usage and camping, providing visitors with the following facilities: car park area, picnic and camping areas, tables, gas bbqs, toilet block, shelter shed, and a walking track. Signage is evident at the site, though minimal. The layout of the site is presented in Figure 4. See Section 2 for details of infrastructure/built environment.

Opportunities

Recreational The main activity-based recreational opportunities available at this site are swimming, picnicking, camping, walking (see Section 1 for details). There is one walking track present, a graded gravel path which leads to Paradise Waterhole. This track is classified as a *Pathway 2* (Wet Tropics Walking Strategy, 2001). The current status of the tracks is outlined in detail in Section 2. Visitor comments relevant to the track and infrastructure are presented in Section 1. Other recreational opportunities available include: photography and bird/wildlife watching.

Experiential In addition to the activity-based recreational opportunities outlined above, Big Crystal provides important experiential opportunity such as nature appreciation and experience including observing scenery and possible wildlife encounters, socialising with family and friends, rest and respite.

Visitation

Compared to other sites in the Wet Tropics, Big Crystal experiences low to medium levels of visitation with approximately 48,000 visitors per year (Mossman Gorge > 400,00 visitors per year). This visitation is lowest in June and July (680-682 vehicles) and highest in January (2,677 vehicles), and is spread evenly across the week days but with considerable increase during weekends.

Site Maps

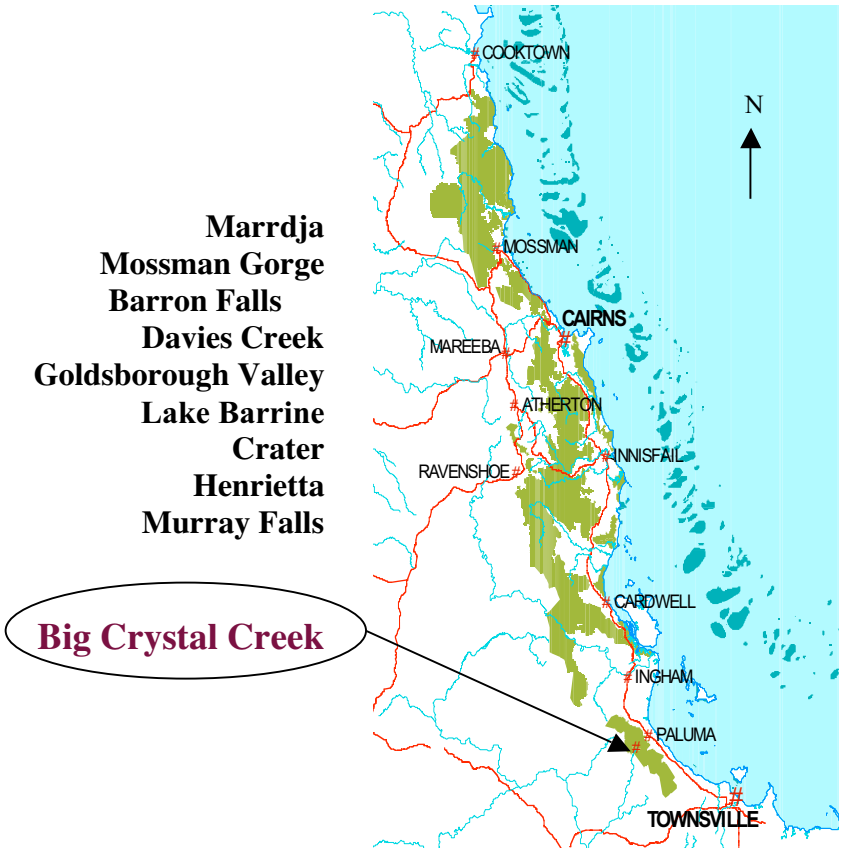


Figure 3: Site location within the Wet Tropics World Heritage Area.

Wet Tropics World Heritage Area of Australia

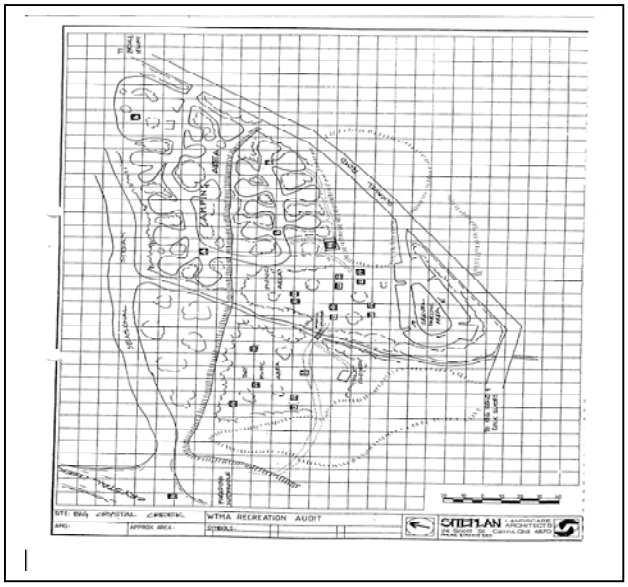


Figure 4: Big Crystal Creek site map.
(Source: SitePlan Landscape Architects, 1993)

Site Management

Queensland Parks and Wildlife Service/Environmental Protection Agency

The Queensland Parks and Wildlife Service/Environmental Protection Agency (QPWS/EPA) is responsible for the on-ground day-to-day management and upkeep of Big Crystal Creek site.
According to the management principles for Queensland's National Parks:

A national park is to be managed to –

(a) As the cardinal principle, "provide, to the greatest possible extent, for the permanent preservation of the area's natural condition and the protection of the area's cultural resources and values; and

(b) Present the area's cultural and natural resources, and their values; and

(c) *Ensure that the only use of the area is nature-based and ecologically sustainable."*

(The State of Queensland, EPA, 2001, p.7)

In the context of *sustaining recreational and tourism opportunities* the following principles were identified in the Master Plan for Queensland's Park System (The State of Queensland, EPA, 2001):

> *A range of opportunities will be provided for visitors to enjoy parks, and interpretive programs will enhance visitor awareness, appreciation and protection of natural and cultural heritage.*
>
> *The park system will be managed to provide visitors with facilities that are safe and are located, designed, constructed and maintained to meet appropriate safety standards, and with information that will provide visitor awareness of the hazards present in parks and the levels of skill and competence required to cope with the risks they may face.*

Wet Tropics Management Authority

The Primary Goal for the Wet Tropics World Heritage Area is to implement Australia's international duty to *"protect, conserve, present, rehabilitate and transmit to future generations the Wet Tropics World Heritage Area, within the meaning of the World Heritage Convention."*

Site Specific Management Intent

Big Crystal Creek site is classified as a Zone D site by the WTMA's zoning scheme. This zoning system is based on a "distance from disturbance" model. The WTMA management intent for this zone type is described below:

"To accommodate developed visitor facilities to enable visitors to appreciate and enjoy the Area. To ensure that the impact of visitor infrastructure is managed to minimize the effect on the integrity of the Area" (Wet Tropics Management Authority, 1997 p.33).

In addition, the Wet Tropics Management Authority's (WTMA) Visitor Opportunity Class system describes Big Crystal Creek site as a Visitor Facility Node (Class 4). The criteria for this category of site, as defined by the WTMA (1997 p.94), are detailed below:

- An area where a visitor may expect opportunities for presentation, intensive social interaction, and where management presence may be obvious;
- Accessible by vehicle along presentation roads;
- Having developed visitor facilities such as formal car parks, toilets, picnic facilities and camping areas;
- Providing access to a range of recreation opportunities;
- Having the potential for further development of visitor facilities.

Executive Summary

Section One :
Psychological & Behavioural

Visitor Survey & Behavioural Observations 2001 & 2002

Visitor Survey Analyses

The following key findings are based on the visitor survey being undertaken over four days in September 2001 and April 2002, and a respondent number of 141.

Visitor Profile

- Big Crystal Creek is an ***important local use site,*** particularly for those community residents from the ***Southern region*** of the WTWHA. Many are ***repeat visitors***.
- It is a site most frequently used by people between ***20 and 29 years of age*** and who travel in a ***private*** car.

Prior Information Sources used

- Most people know of Big Crystal because they ***have been before.*** Very few visitors to Big Crystal use the web and information centres.

Reasons for Visiting

- The primary reasons given for why people visit Big Crystal are to ***rest and relax and to socialise with family and friends.***

Visitor Appraisal of Natural Environment

- Visitors find the ***natural features*** of Big Crystal to be ***mildly interesting*** and in ***acceptable condition.***
- Of those visitors who had particular expectations of what they would find and were unable to, most were related to the ***lack of water*** in the creek.

Time Spent and Activities Engaged in

- Visitors spend just enough time at Big Crystal to undertake a ***short walk and a swim – two hours.***
- Visitors also use the site for ***picnics***.
- ***Photography*** and ***bird watching*** are not activities undertaken by many visitors.

Visitor Appraisal of Signage

- Of the information types available, ***rules and regulation*** received the highest assessment.
- Over two thirds of the visitors agreed to some extent that the ***safety information*** was easy to locate.
- Most visitors found the map at Big Crystal easy to locate however, wayfinding ability as determined by the map information and orientation signs did not receive as high an assessment.
- ***Natural, ecological, cultural and historical information*** were rated low by visitors to Big Crystal.

Visitor Appraisal of Built Environment

- Overall, visitor satisfaction with the ***condition of the facilities*** was moderate.
- The most frequently requested additional facility was ***rubbish bins*** – none exist at the site.
- The walking track was the most popular facility used at Big Crystal.

Visitor Knowledge of Management Agencies

- Visitors on the whole are ***unfamiliar*** with the agency responsible for managing Big Crystal.
- The World Heritage status of Big Crystal is also ***unknown*** to the vast majority of visitors.

Visitor Appraisal of Social Environment

- ***Experienced crowding*** does not appear to be a problem for the majority of visitors to Big Crystal.
- Visitor experience at the site was highest in terms of ***enjoyment*** and ***well worth the money.***

Experience & Satisfaction

- ***Natural features*** at Big Crystal enhanced visitor enjoyment, while the ***behaviour of other visitors*** and problems with ***insects***, detracted from visitor enjoyment.

Comments

Visitors mainly commented on the ***negative aspects*** of the site.

- The ***facilities*** at the site were most frequently commented on. In particular, the ***absence of rubbish bins*** and ***poor condition of the walking track.***

- Comments related to improvement of ***facilities*** included:
  - bins being readily provided,
  - a tap being provided in the picnic area,
  - better toilet paper,
  - upgrading of the walking track.

Positive comments were related to the experiential and activity aspects of the site.

Behavioural Observations

From the behaviours recorded at Big Crystal in September 2001 and April 2002, the following were the most frequently observed.

- **Feeding Wildlife**

  In all cases of wildlife feeding, visitors were feeding birds, specifically turkeys and kookaburras.

- **Inappropriate Behaviour**

  Visitors were observed picking bark from trees and littering, one visitor was observed urinating in the bushes. Some visitors were offended and frequently commented on a female visitor who remained topless during her visit to Big Crystal.

Section Two:

Infrastructure Inventory and Profile

Key Findings

Site Infrastructure Inventory & Assessment

For this research a detailed assessment of infrastructure was not undertaken, however the following summary observations were made.

- Big Crystal contains four key activity nodes – ***Car Park, Picnic Area, Camping Area*** and ***Walking Track.***
- Within each of these nodes a variety of ***infrastructure*** has been established.

Car Park
- The main car park services both the picnic area and the walking track to Paradise Waterhole.
- The car park consists of a circuit road around a central vegetated section and is separated from the picnic area by timber bollards.
- Capacity of the car park is approximately 18 cars.

Picnic area
- The picnic area contains picnic tables, seats and gas bbqs, but there are no taps in this area.

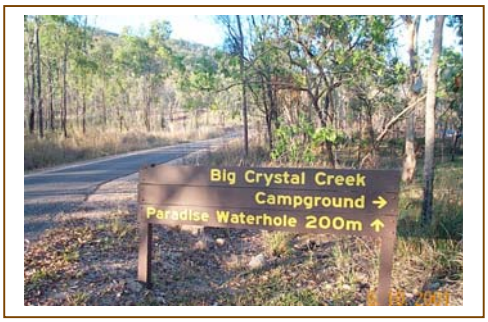
Camp Area
- The camping area is separated from the picnic area and is divided into three broad sections separated by a road.
- The toilet block is situated between the picnic and camping areas easily accessible from both locations.

Walking Track to Paradise Waterhole
- The walking track varies in terms of condition. Sections that are sealed are in reasonable condition, but some erosion is evident in the unsealed areas.
- A shelter/change shed is located at the beginning of the track.

Site Information and Signage

A detailed inventory of signage was not undertaken during this research, however an overview of the types of signage present was possible.

- Signs were located in ***each of the activity nodes*** as well as along the ***access road***.
- Signs in all of the DNR categories were present at this site.
- Despite this being a World Heritage Area site, there was no signage to identify it as such.



Section Three:

Vehicle and Visitor Monitoring

Key Findings

Vehicle and Visitor Records

- Most common vehicle type accessing Big Crystal was the ***car*** (72%), followed by 4WD (24%).
- The highest number of people at the site at one time was ***85*** (1430 hours 14th April 2002).
- Most of the visits to Big Crystal occurred in the ***afternoon***, between 1330 and 1500 hours.
- On average, people stayed at Big Crystal for ***103 minutes*** (just over one & half hours).
- One quarter of the visits was approximately ***two hours or longer***.

Traffic Counter Data

- A total of ***13,481 vehicles*** and ***47,977 people*** visited Big Crystal in the year (September 2001-2002).
- On average, ***1,117 vehicles*** and ***3,977 people*** visited this site ***each month,*** range 680 to 2,677 vehicles.
- ***December and January*** received the ***highest visitation rates***.
- On average, ***258 vehicles*** and ***1,206 people*** visited Big Crystal ***each week***, range 113 to 795 vehicles.
- ***Daily*** vehicle numbers ranged from ***1 to 294***.
- ***A***verage ***weekday*** vehicle number was ***27 per day,*** which is relative to previous records: 16.5 (wet), 27.2 (dry) vehicles (Manidis Roberts, 1993/1994).
- Average ***weekend*** vehicle number was ***62 per day,*** which represents a decrease from previous records: 114.7 (wet), 71.5 (dry) vehicles (Manidis Roberts, 1993/1994).

Section Four:

Management Considerations

Key Findings

Presentation

- The presentation of Big Crystal as a World Heritage Area site is problematic as very few visitors are aware of its World Heritage Area status.
- Indigenous and nonindigenous cultural attributes of the site are not at all presented in terms of interpretive signage.
- Natural attributes are reasonably presented in terms of appeal, condition and management but not in the interpretive signage present.
- Management identity of the site is not well presented and their responsibilities in terms of visitor appraisal of the condition and management of the built environment is only moderately presented.
- Site layout and design, infrastructure and facilities are functional.

Opportunities

- Big Crystal is providing for and facilitating activity-based recreational opportunities in a reasonable way.
- Experienced-based opportunities are important for visitors and are reasonably accommodated for at this site.

Specific Problems and Issues

- Principal behaviour management problems relate to risk behaviour such as speeding.
- Inappropriate behaviour most evident included littering and playing loud music.

Sectio One

Psychological & Behavioural

Visitor Survey & Behavioural Observations 2001 & 2002

SECTION ONE

- Descriptive Analyses of Survey
- Additional Comments on Survey
- Comments to Field Assistants
- Behavioural Observations

Visitor Survey of the Wet Tropics Region in North Queensland Dry (Stage 1) and Wet (Stage 2) Season 2001/02

GENERAL DESCRIPTIVE DATA ANALYSES

Survey Location: **Big Crystal Creek – Paluma Range National Park**

	Stage 1	Stage 2
Survey Dates	6th & 7th October 2001	13th & 14th April 2002
Survey Times	0830 to 1700 each day	0830 to 1700 each day
Weather	91.6% Sunny 2.4% Overcast 0.0% Raining 2.4% Hot 3.6% Warm 0.0% Cool	6.9% Sunny 91.4% Overcast 1.7% Raining 0.0% Hot 0.0% Warm 0.0% Cool

This visitor survey was undertaken over two periods, September 2001 and April 2002. For clarity of presentation the data analysis/results corresponding to these data collection periods are represented in two colours, grey and green, and for the combined, dark red:

Stage 1: September 2001

Stage 2: April 2002

In addition, where comparative data is available from Manidis Roberts 1993 and 1994 data collection periods this is included in the relevant section and is represented in yellow.

Comparative Data ***(Manidis Roberts 1993/1994)***

- Primary data analysis for this section of the report has been undertaken by Bronwyn Guy, James Cook University.

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Questionnaire Profile

Because Big Crystal is a relatively low use site (48,000 visitors per year – 2001/2002), it was possible during the survey distribution period to approach many visitors to the site. Over four days of field work ***182*** people were approached to take part in this survey. Of the ***146 (80.2%)*** who agreed to participate, ***141*** surveys were successfully completed and analysed. The results presented in this section are therefore representative of those using Big Crystal at the time during which surveys were undertaken. The following tables outline the details of respondent participation and survey distribution.

a) Type of Questionnaire Distributed & Returned

A total of **141 questionnaires** made up this analysed data set, all of which were completed on site.

	Stage 1: 2001		Stage 2: 2002		Combined	
	n	Percentage	n	Percentage	n	Percentage
On-Site	83	100%	58	100%	141	100%
Take-Home	0	0	0	0%	0	0%
Total	**83**	**100%**	**58**	**100%**	**141**	**100%**

b) Status of Questionnaire Returns

Of the **146 questionnaires returned**, 3.4% were rejected for the following reasons: they were over 50% incomplete, or they were posted back well after data entry and analysis had been completed.

	Stage 1: 2001		Stage 2: 2002		Combined	
	n	Percentage	n	Percentage	n	Percentage
Analysed: Completed	83	95.4%	58	98.3%	141	96.6%
Rejected: Incomplete, under age, returned too late etc.	4	4.6%	1	1.7%	5	3.4%
Total	**87**	**100%**	**59**	**100%**	**146**	**100%**

c) Non-Response Information

While this is not a complete record of non responses it does provide an estimate of the non response numbers. Details of non responses were not recorded for Stage 2 except for surveys not returned. Of the **182 people approached** over four days of survey distribution, 19.8% would either not take part or failed to return the survey. The main reason given by people was that they had ***no time.***

	Stage 1: 2001		Stage 2: 2002		Combined	
Reasons	n	Percentage total # people approached (115)	n	Percentage total # people approached (67)	N	Percentage total # people approached (182)
Not returned			8		8	4.4%
Filled in other/same survey	6				6	3.3%
Reading difficulties	2				2	1.0%
No time	10				10	5.5%
Not interested	8				8	4.4%
Visiting Baptists	2				2	1.0%
Non-Response	**28**	**24.3%**	**8**	**11.9%**	**36**	**19.8%**

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a) Background Information *Key Findings*

Stage 1: September 2001 *Visitor Profile*

During this first data collection stage,

- The majority of visitors (respondents) to Big Crystal were ***Australian*** (as opposed to international visitors). Of the Australian visitors, most were ***local*** visitors, i.e., they lived within the southern section of the Wet Tropics bioregion;
- ***Nonindigenous Australians*** were the major ethnic group;
- The highest level of education achieved for the majority of visitors was ***secondary;***
- The average age of visitors was ***28.26 years***, and the majority were in the ***20 – 29 age class***;
- More females participated in this survey than males.

Stage 2: April 2002 *Visitor Profile*

Due to poor weather, there were fewer survey participants in the second stage.

- Similar to Stage 1, the majority of visitors were ***Australian.*** Of these Australian visitors, the majority lived within the southern section of the Wet Tropics bioregion;
- ***Nonindigenous Australians*** were still the major ethnic group;
- The highest level of education achieved for the majority of visitors was ***secondary***;
- The average age of visitors increased slightly to ***32 years,*** but with the majority in the ***20 – 29 age class***;
- There were more females than males who participated in this survey.

Combined Data & General Comments

For the combined data set, the visitor profile was as follows:

- The majority of visitors to Big Crystal were ***Australian (93.6%),*** which is slightly lower than to the 1993 Manidis Roberts results (98%), with international visitors at 6.4%. There were significantly more Australians at the site than international visitors overall.
- Of the Australian visitors, the majority were ***locals (83.5%),*** i.e., living within the Wet Tropics bioregion. Of these, ***81.4%*** came from ***Townsville & district***.
- Just over two thirds of the visitors (66.9%) identified themselves as ***Nonindigenous Australians***.

1. *This visitor profile suggests that Big Crystal is **an important local use site**, particularly for those local community residents of the **southern region*** of the WTWHA.
2. *It is also a site that is used most frequently by people between 20-29 years of age with a secondary level of education.*

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a) Background Information

QUESTIONS & RESULTS

1. Where do you live?

STAGE 1: (September/October 2001)						STAGE 2: (March/April 2002)					
n = 83						***n = 58***					
Australia	**95.2%**		**n = 79**			**Australia**	**91.4%**		**n = 53**		
Locals	n = 68	(90.7%)	(n = 75 responses)			Locals	n = 37	(86.0%)	(n = 43 responses)		
Cairns & District	n = 3	Townsville & District	n = 65			Townsville & District Ingham	n = 31 n = 4	Innisfail Cairns	n = 1 n = 1		
Non-Locals	n = 7	(9.3%)				Non-Locals	n = 6	(14.0%)			
Overseas	**4.8%**		**n = 4**			**Overseas**	**8.6%**		**n = 5**		
Switzerland	n = 1	UK	n = 1	USA	n = 1	Sweden	n = 1	Switzerland	n = 1	UK USA	n = 1 n = 1

Comparative Data 1993: *Australian = 98.0% (Local = 86.0%);* *Overseas = 2.0%* *n = 50*

2. How long have you lived there?

Period of Residence: ***n = 79***	Period of Residence: ***n = 51***
$\overline{X}$ **= 11.95 years ± SD 12.26 (range 0.1-47)**	$\overline{X}$ **= 17.98 years ± SD 17.74 (range 0.15-67)**
≤ 10 years = 51.9% > 10 years = 48.1%	≤ 10 years = 51.0% > 10 years = 49.0%

3. How would you describe your ethnic background?

n = 83		*Other*		***n = 56***		*Other*	
		Non Indig / English	1.2%	**Nonindigenous Australian**	**64.3%**	*Other*	*3.4%*
Nonindigenous Australian	**62.7%**	*Non Indig/Sth African*	1.2%	Indigenous Australian	10.7%	*Greek*	*1.7%*
Indigenous Australian	2.4%	*Non Indig / Scottish*	1.2%	Swedish	7.1%	*Non Indigenous /*	
Canadian	1.2%	*Non Indig / German*	1.2%	Swiss	1.7%	*Indigenous Australian*	*1.7%*
Swiss	1.2%	*Non Indig / Italian*	1.2%	Italian	1.7%		
Scottish	1.2%	*American / English /*		English	9.0%		
German	1.2%	*Scottish*	1.2%	Scottish	1.7%		
Italian	1.2%	*American / Irish*	1.2%				
English	6.0%	*German / English*	1.2%				
Irish	1.2%	*English / Irish*	2.4%				
		English / Irish /					
		Scottish	1.2%				
		Irish / Scottish	2.4%				
		Korean	3.6%				
		South African	1.2%				
		Urasian	1.2%				

4. What is the highest level of formal education you have completed so far?

n = 83		%	***n = 58***		%
Primary	(1-8 years of education)	4.8%	Primary	(1-8 years of education)	5.2%
Secondary	**(9-12 years of education)**	**45.8%**	**Secondary**	(9-12 years of education)	**46.6%**
Tertiary A	(Technical or further educ institution)	19.3%	Tertiary A	(Tech or further educ institution)	19.0%
Tertiary B	(University)	30.1%	Tertiary B	(University)	29.3%

5. Age

n = 73	***n = 53***
$\overline{X}$ **= 28.26 years ± SD 10.81 (range 12-55)**	$\overline{X}$ **= 32.47 years ± SD 11.42 (range 13-67)**
Age Categories:	Age Categories:
< 20 years = 23.3% 40-49years = 17.8%	< 20 years = 9.4% 40-49years = 20.7%
20-29years = 38.4% 50-59 years = 2.7%	**20-29years = 35.8%** 50-59 years = 7.5%
30-39years = 17.8% > 60 years = 0.0%	30-39years = 24.5% > 60 years = 1.9%

Comparative Data 1993: *16-25 = 44.0%;* *26-45 = 50.0%;* *45-65 = 6.0%* *>65 = 0.0%* *n = 50*

6. Gender

n = 81 Male 45.7% Female 54.3%	***n = 57*** Male 42.1% Female 57.9%

Comparative Data 1993: *Male = 62.0%;* *Female = 38.0%* *n = 50*

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b) Transport & Travel Group *Key Findings*

Stage 1: September 2001 *Travel Profile*

During this first data collection stage,

- A small number of visitors to Big Crystal were with a non commercial ***organised tour,*** Baptist Youth;
- On average there were ***3.56 people*** in each vehicle;
- The major group profile of people visiting the site was ***groups / families***;
- The majority of visitors travelled in ***privately owned*** vehicles;
- The **most** important source of prior information about Big Crystal used by visitors was ***"been here before"*** and ***"word of mouth".*** The information sources not used were ***"map which said it was a tourist site"*** and ***"the trip was included in a package tour".***

Stage 2: April 2002 *Travel Profile*

Some variations were evident in this second data collection stage.

- Unlike Stage 1, ***no visitors*** to the Big Crystal were with an ***organised tour***,
- There was a increase in the average number of people per vehicle to ***4.02***;
- The major group profile of visitors was ***two adults***;
- Almost all visitors travelled in ***privately owned*** vehicles;
- The **two most** important sources of prior information about the Big Crystal were ***"have been here before"*** *and* "***word of mouth"***. The information sources not used were ***"tourist information centre", "travel guide or booklet", "from the web"*** and ***"trip included in a package tour".***

Combined Data & General Comments

For the combined data set, the visitor profile is as follows:

- Almost all visitors to Big Crystal were ***independent travellers*** (93.6%)***,*** which is lower compared to the 1993 Manidis Roberts results (100%).
- On average, there were ***3.76 people*** in each vehicle, which is higher than 1993 Manidis Roberts results (3.2 people).
- Most visitors, 94.9%, travelled in ***privately owned*** vehicles, which is slightly lower than 1993 Manidis Roberts results (96.0%).
- "***Have been before"*** appeared to be the most important source of prior information about Big Crystal (58.6%). The information sources used by the least number of visitors were ***from the web, maps and information centres.***

1. *It is clear that most people know of Big Crystal because they h**ave been before.** It is a site that **attracts a considerable number of repeat visits by local residents.*
2. *Very few people used **the web** and **NQ information centres.** This would reflect the large number of local, repeat visitors to this site.*

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b) Transport & Travel Group

QUESTIONS & RESULTS

7. Are you with an organised tour?

n = 83 Yes 10.8% No 89.2% Baptist Youth n = 9	***n = 58*** Yes 0% No 100%

8. If you travelled in a private or hired vehicle, how many people including yourself are in your vehicle?

n = 78 People per Vehicle $\overline{X}$ = 3.56 ± SD 1.31 (range 1-7) Adults per vehicle $\overline{X}$ = 2.59 (n = 202) Children per vehicle $\overline{X}$ = 0.97 (n = 76) **Private vehicle 93.8%** Hired Vehicle 6.2%	*n = 57* People per Vehicle $\overline{X}$ = 4.02 ± SD 1.67 (range 1-9) Adults per vehicle $\overline{X}$ = 2.79 (n=159) Children per vehicle $\overline{X}$ = 1.23 (n = 70) **Private vehicle 96.4%** Hired Vehicle 3.6%

Comparative Data 1993: ***People per vehicle = 3.2 n = 50 Private vehicle = 96.0%; Hired vehicle = 4.0%; Commercial = 0%; Other = 0%***

9. How did you obtain prior information about this site?

n = 82	n	%	***n = 58***	n	%
Have been here before	45	**54.9%**	**Have been here before**	37	**63.8%**
Road sign	12	14.6%	Road sign	2	3.4%
Word of mouth	33	40.2%	Word of mouth	21	36.2%
Map which said it was a tourist site	0	0.0%	Map which said it was a tourist site	1	1.7%
Tourist information centre in Nth Qld	1	1.2%	Tourist information centre in Nth Qld	0	0.0%
Tourist information centre	1	1.2%	Tourist inform	1	1.7%
Tourist leaflet	3	3.7%	Tourist leaflet	1	1.7%
Travel guide or book	3	3.7%	Travel guide or book	0	0.0%
From the web	1	1.2%	From the web	0	0.0%
Trip included in a package tour	0	0.0%	Trip included in a package tour	0	0.0%
Other	7	*8.5%*	*Other*	*5*	*8.5%*
Church Group	3	*3.7%*	*Ken Clark*	*1*	*1.7%*
Local / lived in area	3	*3.7%*	*Local / lived in area*	*1*	*1.7%*
School visit	1	*1.2%*	*Talked to Australians*	*1*	*1.7%*
			Worked here before	*1*	*1.7%*
			World experience	*1*	*1.7%*

Specify: Tourist inform centre: *Parks Service* Tourist leaflet: *N/A* Travel guide or book : *Lonely Planet*	*Specify:* Tourist inform centre: *N/A* Tourist leaflet: *N/A* Travel guide or book : *N/A*

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c) Reasons for Visiting ***Key Findings***

Stage 1: September 2001

During this first data collection stage,

- The most important reasons given for why people visit Big Crystal were ***experiential***, followed by *activity*-based reasons. *Educational* reasons were least important;
- To ***rest and relax*** was the most important reason given followed by ***socialise with friends and family***;
- These were followed by two other experiential reasons - ***be close to/experience nature,*** and ***experience tranquillity***;
- Activity-based reasons were rated, on average, moderately important to important. Of these, ***outdoor exercise*** rated the highest;
- Educational reasons were rated, on average, between not important to important. ***Learning about Aboriginal culture*** was the least important.

Stage 2: April 2002

During this second data collection stage, responses were, on the whole, rated higher than Stage 1.

- Like Stage 1, the most important reasons for why people visit Big Crystal were again ***experiential***, followed by activity-based reasons. Educational reasons were least important.
- To ***rest and relax***, followed by to ***socialise with family / friends*** were the two most important reasons given;
- These were followed by two other experiential reasons - ***experience tranquillity*** and ***be close to/experience nature;***
- Activity-based reasons were rated, on average, moderately important to important. Of these, ***outdoor exercise*** again rated the highest;
- Educational reasons were rated, on average, between slightly and moderately important. ***Learning about Aboriginal culture*** was the least important.

Combined Data & General Comments

- The most important reason given for visiting the site was rated ***very important*** by 56.1% of visitors – ***rest and relax.*** Visitors rated experiential reasons ***significantly higher*** than activity-based reasons [$t(138) = -12.644$; $p = 0.00$].
- Visitors rated the two educational reasons ***significantly lower*** than experiential [$t(135) = -21.616$; $p = 0.00$], and activity reasons [$t(135) = -8.262$; $p = 0.00$]. ***Learn about aboriginal culture*** was the least important reason given and was rated ***not important*** by ***59.7%*** of visitors.

1. *The primary reasons given for people visiting Big Crystal were to* ***rest and relax*** *and to* ***socialise with family/friends.***
2. *Clearly, at this site activity-based reasons were secondary for most people.*

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c) Reasons for Visiting

QUESTIONS & RESULTS

10. We would like to know how important the following reasons were for you visiting this site today.

1 = Not important **2 = Slightly important** **3 = Moderately important**
4 = Important **5 = Quite important** **6 = Very important**

	n	Not Important 1	2	3	4	5	Very Important 6	$\overline{X}$ *
a) Learn about native animals and plants *(Educational)*	81	38.3%	23.5%	19.8%	7.4%	7.4%	3.7%	*2.33*
	55	38.2%	23.6%	9.1%	9.1%	7.3%	12.7%	*2.62*
b) Learn about Aboriginal culture *(Educational)*	80	**62.5%**	18.8%	5.0%	7.5%	2.5%	3.8%	*1.80*
	54	**55.6%**	22.2%	5.6%	1.9%	5.6%	9.3%	*2.07*
c) See natural features and scenery *(Experiential)*	80	8.8%	3.8%	18.8%	18.8%	25.0%	25.0%	*4.22*
	57	5.3%	5.3%	3.5%	17.5%	21.1%	47.4%	*4.86*
d) Be close to/experience nature *(Experiential)*	76	13.2%	6.6%	5.3%	23.7%	18.4%	32.9%	*4.26*
	57	3.5%	3.5%	7.0%	19.3%	15.8%	**50.9%**	*4.93*
e) Socialise with family/friends *(Experiential)*	80	3.8%	1.3%	5.0%	10.0%	23.8%	**56.3%**	*5.18*
	58	1.7%	0.0%	5.2%	13.8%	25.9%	**53.4%**	*5.22*
f) Rest and relax *(Experiential)*	81	1.2%	1.2%	7.4%	11.1%	25.9%	**53.1%**	*5.19*
	58	0.0%	0.0%	6.9%	8.6%	24.1%	**60.3%**	*5.38*
g) Experience tranquility *(Experiential)*	81	7.4%	8.6%	13.6%	22.2%	19.8%	28.4%	*4.23*
	56	1.8%	1.8%	8.9%	17.9%	26.8%	42.9%	*4.95*
h) Experience the Wet Tropics *(Experiential)*	81	19.8%	14.8%	12.3%	22.2%	13.6%	17.3%	*3.47*
	57	3.5%	7.0%	26.3%	17.5%	15.8%	29.8%	***4.25***
i) Outdoor exercise *(Activity)*	80	10.0%	11.3%	18.8%	26.3%	18.8%	15.0%	*3.78*
	57	10.5%	12.3%	19.3%	19.3%	17.5%	21.1%	*3.84*
j) Opportunities for short walks *(Activity)*	81	16.0%	21.0%	14.8%	14.8%	18.5%	14.8%	*3.43*
	56	17.9%	10.7%	19.6%	16.1%	19.6%	16.1%	*3.57*
k) Opportunities for long walks *(Activity)*	79	31.6%	22.8%	16.5%	8.9%	13.9%	6.3%	*2.70*
	56	30.4%	17.9%	25.0%	10.7%	7.1%	8.9%	*2.73*
l) Other	82	3.7%	0.0%	1.2%	0.0%	2.4%	20.7%	***N/A 72.0%***
	55	0.0%	0.0%	0.0%	0.0%	3.6%	18.2%	***N/A 78.2%***

Specify other reasons:	n	Activity:	n	Experiential:	n	Educational:	n
*Reasons provided have been placed into three major categories. Those that are related to **activity, experience, education.** The fourth category is **"other"**.*	18	Swimming	12	Spending time with family	1		
		To eat	1			Other:	
		Checking for rubbish	1	Church activity	2	Birds	1
	12	Activity:	n	Experiential:	n	Educational:	n
		Fish	1	Waterfalls	3		
		Swimming	4	Family experience	1		
		Work	1			Other:	
		Break from assignments	1			Crocodiles	1

$\overline{X}$ = The mean of the categories are presented despite this being ordinal data and the precautions necessary in interpreting this data.

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d) Natural Environment — *Key Findings*

Stage 1: September 2001 *Visitor Appraisal*

During this first data collection stage,

- On average, visitors were just ***mildly agreeing*** with the positive aspects of the natural environment at Big Crystal was;
- Aspects of the natural environment that received the highest ratings were ***well managed, interesting*** and in ***good condition***;
- Just over half of visitors (57.3%) indicated ***some level of concern*** about the ***impacts of human activity*** on the natural environment at Big Crystal, however two thirds of visitors (64%) did not consider the site to be disturbed or impacted;
- Just over one quarter of the visitors were expecting other natural features at the site, especially ***more water***.

Stage 2: April 2002 *Visitor Appraisal*

During this second data collection stage, most responses were higher compared to Stage 1.

- ***Visitor appraisal*** of the positive aspects of the natural environment was ***moderate***;
- Just under half of the visitors (44.8%) ***strongly agreed*** that Big Crystal was ***interesting***;
- In terms of the ***appeal*** of natural features at Big Crystal ***41.4% strongly agreed,*** and ***36.2% strongly agreed*** that the ***condition*** of the natural environment appeared to be ***good***;
- ***59%*** of visitors ***somewhat to strongly agreed*** that the natural environment was ***well managed***;
- While the majority of visitors were, to some degree, ***concerned*** about the ***impacts of human activity*** on the natural environment, the majority did not agree that the site appeared to be disturbed or impacted.

Combined Data & General Comments

For the combined data set,

- Aspects of the natural environment that were rated the highest but still with respondents only mildly to somewhat agreeing were: ***interesting*** ($\overline{X}$ ***= 4.57), well managed*** ($\overline{X}$ **= 4.56),** and ***good condition*** ($\overline{X}$ ***= 4.52).***
- Of those visitors *(19.4%)* who had particular expectations of what they would find or encounter most were related to lack of water.

1. *These results suggest that, overall, visitors find the natural features of Big Crystal to be* ***mildly interesting*** *and in* ***only just an acceptable condition.***

2. *Of the natural features that the small number of visitors reported expecting to find at Big Crystal but were unable to, most were related to* ***lack of water*** *in the creek.*

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d) Natural Environment

QUESTIONS & RESULTS

11. The following statements are about the natural features of this site. Please rate the extent to which you agree or disagree with each statement by circling the number that best reflects your level of agreement /disagreement.

1 = Strongly Disagree 2 = Somewhat Disagree 3 = Mildly Disagree
4 = Mildly Agree 5 = Somewhat Agree 6 = Strongly Agree

		n	Strongly Disagree 1	2	3	4	5	Strongly Agree 6	$\overline{X}$ *
a)	The natural environment at this site is interesting.	81	2.5%	4.9%	22.2%	23.5%	28.4%	18.5%	*4.26*
		58	0.0%	5.2%	5.2%	19.0%	25.9%	44.8%	***5.00***
b)	I would like to spend more time exploring this natural environment.	81	3.7%	12.3%	22.2%	29.6%	18.5%	13.6%	*3.88*
		58	1.7%	6.9%	13.8%	22.4%	19.0%	36.2%	*4.59*
c)	In terms of natural attractions and scenic beauty this site is appealing.	80	1.3%	6.3%	23.8%	27.5%	27.5%	13.8%	*4.15*
		58	0.0%	5.2%	6.9%	15.5%	31.0%	41.4%	*4.97*
d)	The condition of the natural environment at this site appears to be good.	82	2.4%	8.5%	20.7%	17.1%	36.6%	14.6%	***4.21***
		58	1.7%	0.0%	1.7%	29.3%	31.0%	36.2%	*4.97*
e)	The natural environment at this site is well managed.	81	1.2%	4.9%	8.6%	37.0%	33.3%	14.8%	***4.41***
		56	0.0%	0.0%	8.9%	32.1%	30.4%	28.6%	***4.79***
f)	I am concerned about the impacts of human activity on the natural environment at this site.	82	9.8%	13.4%	19.5%	24.4%	14.6%	18.3%	*3.76*
		57	7.0%	12.3%	19.3%	15.8%	19.3%	26.3%	*4.07*
g)	This site appears to be disturbed and impacted.	82	12.2%	34.1%	18.3%	24.4%	4.9%	6.1%	*2.94*
		57	22.8%	28.1%	19.3%	15.8%	3.5%	10.5%	*2.81*

12. At this site were there any natural features you were expecting to find which were not present?

n = 78	Yes 26.9%	No 73.1%	***n = 56***	Yes 8.9%	No 91.1%

If yes, please specify:

*Responses provided have been placed into three major categories. Those related to **natural/biological** features, **natural/physical** features, and the **built/structural** features of the environment.*

	Natural/Biological:	n	Natural/Physical	n	Built/Structural	n
19	Native animals	1	Attractiveness /		Pub with cold	
	Eels	1	Tranquility	2	beer	1
	Goanna	1	More water	10	Site map	1
	Fish	1	A fire	1		
3	Natural/Biological: Wildlife (platypus, riffle bird etc.)	2	Natural/Physical Waterfalls / rainforest	1	Built/Structural	

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e) Time Spent and Activities ***Key Findings***

Stage 1: September 2001 *Activity Profile*

During this first data collection stage,

- Most visitors, ***27.5%***, camped overnight at the site, however of the day visitors, the majority spent approximately between one and two hours at the site;
- The activities that visitors most frequently engaged in were ***swimming, relaxing*** and having ***a picnic / barbeque;***
- ***Observing scenery*** and going for a ***short walk*** were also activities quite a number of people engaged in;
- Of those visitors who would have liked to engage in other activities, to ***have a fire*** and ***to swim where it wasn't crowded*** were most frequently identified.

Stage 2: April 2002 *Activity Profile*

During this second data collection stage, the responses varied slightly.

- Compared to Stage 1, there were much fewer visitors camping at Big Crystal, and the majority of visitors (42.6%) spent between two and three hours at the site;
- The activities most frequently engaged in at Big Crystal were similar to Stage 1; ***swimming, relaxing, observing scenery*** and ***having a picnic / barbeque***;
- ***Observing wildlife*** and ***going for a short walk*** were popular activities with about one third of the visitors;

Combined Data & General Comments

1. *These results suggest that, overall, visitors spend enough time at Big Crystal which allows them to do the short walk and have a swim –* ***two hours****.*
2. *Many visitors use the site for picnics.*
3. *Photography and bird watching are not activities undertaken by many visitors.*

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e) Time Spent and Activities

QUESTIONS & RESULTS

13. How long have you spent at this site today?

n = 80	%		%	*n = 54*	%		%
less than 1/2 hour	11.3%	About 3 hours	6.3%	less than 1/2 hour	5.6%	About 3 hours	13.0%
About 1/2 hour	7.5%	About 4 hours	5.0%	About 1/2 hour	24.1%	About 4 hours	3.7%
About 1 hour	16.3%	More than 4 hours	6.3%	About 1 hour	9.3%	More than 4 hours	11.1%
About 2 hours	20.0%	**Overnight**	**27.5%**	**About 2 hours**	**29.6%**	Overnight	3.7%

Comparative Data 1993: *<1/2 hr = 22%, _-<1 hr = 12%, 1-<2hrs = 24%; 2-<4hrs = 18%, n = 50*

14. What activities did you engage in at this site today?

n = 79		*n = 55*	
Activities:	**%**	**Activities:**	**%**
Observing scenery	53.8%	**Observing scenery**	**60.0%**
Bird watching	13.8%	Bird watching	18.2%
Observe other wildlife	32.5%	Observe other wildlife	29.1%
Photography/painting/drawing	15.0%	Photography/painting/drawing	9.1%
Picnic/barbeque	49.4%	Picnic/barbeque	50.9%
Using café/restaurant	0.0%	Using café/restaurant	0.0%
Camping	27.5%	Camping	3.6%
Walking – Short (1 hr or less)	37.5%	Walking – Short (1 hr or less)	29.1%
Walking – Long (1-6 hours)	2.5%	Walking – Long (1-6 hours)	1.8%
Swimming	**83.8%**	**Swimming**	**74.5%**
Guided tour	1.3%	Guided tour	0.0%
Looking at interpretation material	5.0%	Looking at interpretation material	1.8%
Relaxing	71.3%	**Relaxing**	**69.1%**
Other	7.8%	*Other*	*10.3%*
Chatting / Socialising	2.6%	*Avoiding mosquitoes*	*1.7%*
Education about Christ	1.3%	*Beer drinking*	*1.7%*
Filling out questionnaire	1.3%	*Filling out questionnaire*	*5.2%*
Snorkelling	1.3%	*Work*	*1.7%*
Work	1.3%		

Comparative Data 1993: *Swimming = 86 %; Picnic = 32%; Walking(short) = 28%; Nature Study = 10% Relaxing = 50%; n = 50*

15. Were there particular things you wanted to do at this site which you were unable to do?

n = 71 Yes 23.9% No 76.1%

n = 47 Yes = 6.4% No = 93.6%

If yes, please specify:

Responses provided have been placed into five major categories. Those activities related to ***natural, built, or social*** *environment, and* ***rules/regulations****.*

n = 15	n		n		n
Natural Environ		Built Environ		Social Environ	
Rock Slides	1			Swim: too crowded	5
Walking	1			Drawing	1
				Rules/regulation	
				Have a fire	5
				Drink alcohol	2

n = 1	n		n		n
Natural Environ		Built Environ		Social Environ	
Rocks too slippery for older person to go swimming	1	Rules/regulation			

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f) Information ***Key Findings***

Stage 1: September 2001 *Information/Signage Use*

During this first data collection stage,

- Most visitors agreed to some extent that ***directional signage*** was easy to locate, and enabled them to find their way round Big Crystal, but this assessment was generally low;
- About one third of visitors (33.3%) were unable to ***determine*** the ***rules and regulations*** nor identify what was ***acceptable activity*** (30.6%), although on average this signage was rated higher than directional signage;
- Approximately two thirds of visitors (66.7%) agreed that ***safety*** information was ***easy to locate*** and almost three quarters of visitors (73%) agreed that it was ***understandable***;
- Visitor assessment of the ***natural / ecological*** information was low, which is understandable given that this type of information is very limited at this site.

Stage 2: April 2002 *Information/Signage Use*

During this second data collection stage, ratings of signage were on average higher.

- In both cases, approximately two thirds of visitors agreed to some extent that ***directional*** signage was ***easy to locate (68.6%)*** and aided in ***wayfinding (59.5%);***
- Overall, visitor assessment of the ***rules and regulations*** at Big Crystal was slightly higher for this data collection stage compared to the first;
- Over one third of the visitors ***strongly agreed*** that ***safety information*** was ***easy to locate*** (38.5%) and that it was ***easy to understand*** (42%), and this safety signage was, on average, rated the highest;
- Visitor assessment of the ***natural / ecological*** information was again alow.

Combined Data & General Comments

- While overall most visitors found directional signage at Big Crystal easy to locate ($\overline{X}$ = 4.06), wayfinding ability as determined by presentation of information did not receive as high an assessment ($\overline{X}$ = 3.88).
- The ***rules and regulations*** at Big Crystal were rated the highest of all the information types available with a least one third of visitors finding them easy to determine.
- ***Safety*** information was also found by most visitors ***easy to locate*** and ***understandable.***

1. *Signage in general received a low rating at Big Crystal.*

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f) Information

QUESTIONS & RESULTS

16. Did you refer to any of the information available at this site today?	Yes	14.3%	No	85.7%	n = 77
	Yes	18.9%	No	81.1%	n = 53

17. Please rate the extent to which you agree or disagree with the following statements about <u>information</u> that may be available at this site by circling one number.

All of the signs from (a) to (c) were present at Big Crystal but natural/ecological information was very limited (see Section 2 for details).	n	**Strongly Disagree** 1	2	3	4	5	**Strongly Agree** 6	$\overline{X}$
a) The **maps** and **directions** at this site: *i)* were easy to **locate**	74	12.2%	5.4%	20.3%	27.0%	12.2%	23.0%	*3.91*
	51	3.9%	11.8%	15.7%	19.6%	19.6%	29.4%	*4.27*
ii) helped me to **find** my way round	73	13.7%	2.7%	17.8%	31.5%	13.7%	20.5%	*3.90*
	47	10.6%	14.9%	14.9%	19.1%	19.1%	21.3%	*3.85*
b) The **rules and regulations** at this site: *i)* were easy to **determine**	75	4.0%	5.3%	16.0%	25.3%	16.0%	33.3%	*4.44*
	52	3.8%	9.6%	7.7%	19.2%	17.3%	42.3%	*4.63*
ii) enabled me to **clearly identify** acceptable activities	72	4.2%	4.2%	20.8%	25.0%	15.3%	30.6%	*4.35*
	50	4.0%	10.0%	10.0%	20.0%	16.0%	40.0%	*4.54*
c) The **safety information** at this site: *i)* was easy to **locate**	75	13.3%	5.3%	14.7%	22.7%	18.7%	25.3%	*4.04*
	52	1.9%	11.5%	3.8%	19.2%	25.0%	38.5%	*4.69*
ii) was easy to **understand**	74	9.5%	2.7%	14.9%	24.3%	20.3%	28.4%	*4.28*
	50	2.0%	12.0%	4.0%	16.0%	24.0%	42.0%	*4.74*
d) The **natural/ecological information** at this site: *i)* was **interesting**	68	10.3%	8.8%	29.4%	25.0%	14.7%	11.8%	*3.60*
	51	7.8%	21.6%	17.6%	27.5%	7.8%	17.6%	*3.59*
ii) was clearly **presented**	68	8.8%	13.2%	30.9%	22.1%	16.2%	8.8%	*3.50*
	50	8.0%	22.0%	10.0%	34.0%	8.0%	18.0%	*3.66*
iii) helped me better **understand** the ecological processes of this area	67	11.9%	11.9%	32.8%	25.4%	9.0%	9.0%	*3.34*
	50	8.0%	28.0%	14.0%	30.0%	8.0%	12.0%	*3.38*
f) The **indigenous cultural information** at this site: *i)* was **interesting** *ii)* was clearly **presented** *ii)* helped me to **understand** the significance of this area for indigenous Australians	*No indigenous cultural information present at this site.*							

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g) Site Facilities & Management Issues ***Key Findings***

Stage 1: September 2001 *Visitor Appraisal*

During this first data collection stage,

- The ***walking track*** at Big Crystal and the ***toilet*** facilities were the ***most frequently*** used of all facilities present. Most visitors also used the ***picnic tables*** and ***barbeques.*** The most frequently requested additional facilities were more fire places and barbeques;
- On average, visitors were only ***slightly agreeing*** that facilities were appealing and adequate, in good condition and well managed. The overall ***condition*** of facilities was rated the highest followed by their management;
- Nearly two thirds of the visitors (65.4%) ***agreed*** to some extent that the presence of a ***ranger*** was important;
- The reasons most frequently identified were to ***provide information/education*** and for ***site maintenance***.

Stage 2: April 2002 *Visitor Appraisal*

During this second data collection stage, visitor appraisal of facilities were generally higher.

- The ***walking track*** at Big Crystal was again the ***most frequently*** used facility, followed by the ***toilet and showering facilities*** and the ***picnic tables***. The most frequently requested additional facility was ***rubbish bins***;
- The overall ***condition*** of facilities was rated the highest followed by their management;
- Just over three quarters of the visitors (76.5%) ***agreed*** that the presence of a ***ranger*** was important;
- The reasons most frequently identified were to ***provide information/education*** for ***site maintenance***, and to ***answer questions***.

Combined Data & General Comments

- The ***walking track*** at Big Crystal was the most frequently used followed by the toilet/shower;
- The facility most often requested was ***rubbish bins*** – currently none exist at the site;
- ***Condition of facilities*** received the highest rating ($\overline{X}$ = 4.81), with 63.1% of visitors somewhat and strongly agreeing that the condition was good;
- Of the 70% of visitors for whom the presence of a ranger was important, the majority identified ***providing information/education*** and ***site maintenance*** equally important.

1. *The **walking track** at Big Crystal is the most popular facility at this site.*
2. *Overall, visitors are satisfied with the **condition** of facilities at Big Crystal.*

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g) Site Facilities & Management Issues

QUESTIONS & RESULTS

19. What facilities have you used at this site today?

n = 77	%		%	*n = 58*	%		%
Picnic table	49.4%	**Walking track**	**63.6%**	**Picnic table**	**56.0%**	**Walking track**	**68.0%**
Shelter shed	10.4%	Boardwalk	5.2%	Shelter shed	12.0%	Boardwalk	4.0%
Restaurant/café	1.3%	Viewing platform/lookout	9.1%	Restaurant/café	0.0%	Viewing platform/lookout	14.0%
Rubbish bin	26.0%	Fire place	7.8%	Rubbish bin	24.0%	Fire place	4.0%
Toilet	66.2%	Barbeque	36.4%	**Toilet/showers**	**54.0%**	Barbeque	20.0%
Tap	39.0%	Other (campsite, car park, waterhole)	3.9%	Tap	30.0%	Other (waterhole / swimming)	4.0%

Comparative Data 1993: *Walking track = 54%; toilet = 34%; picnic table = 26%; Tap = 20%; rubbish bin = 38%. bbq = 18% grassed area = 12% n = 50*

20. Were there particular facilities at this site you were expecting to find which were not available?

n = 67	Yes	31.3%	No	68.7%	*n = 44*	Yes	18.2%	No	81.8%

If yes, please specify:

n = 11	n		n	***n = 8***	n		n
A mirror	1	More sheltered tables	2	More sheltered tables	1	Rubbish bins	**5**
Fire places	3 (1)	Tap in picnic area	1	Rope Swing	1	More BBQs	1
More BBQs	2	Rubbish bins	2				

21. Please rate the extent to which you agree or disagree with each of the following statement about the facilities and management at this site by circling one number for each statement.

	n	**Strongly Disagree** 1	2	3	4	5	**Strongly Agree** 6	$\overline{X}$
a) This site is **appealing** in terms of the character and attractiveness of the facilities.	76	1.3%	9.2%	14.5%	42.1%	14.5%	18.4%	*4.14*
	54	1.9%	1.9%	9.3%	25.9%	33.3%	27.8%	*4.70*
b) The facilities at this site are **adequate.**	77	3.9%	2.6%	18.2%	24.7%	31.2%	19.5%	*4.35*
	53	1.9%	3.8%	7.5%	20.8%	39.6%	26.4%	*4.72*
c) The overall **condition** of the facilities at this site appears to be good.	77	0.0%	3.9%	11.7%	26.0%	29.9%	28.6%	*4.68*
	53	1.9%	0.0%	1.9%	26.4%	32.1%	37.7%	***5.00***
d) The facilities and infrastructure at this site are **well managed**.	77	0.0%	5.2%	14.3%	27.3%	28.6%	24.7%	*4.53*
	53	0.0%	0.0%	1.9%	32.1%	34.0%	32.1%	*4.96*
e) The presence of a **ranger** at sites like this is important to me.	78	15.4%	5.1%	14.1%	23.1%	29.5%	12.8%	*3.85*
	51	5.9%	5.9%	11.8%	37.3%	7.8%	31.4%	*4.29*

22. If you agreed the presence of a ranger was important, what are the reasons for this?

n = 75	n	%	*n = 53*	n	%
To provide information/education	35	46.6%	**To provide information/education**	35	**66.0%**
To answer questions	27	36.0%	To answer questions	28	52.8%
To take us on guided walks	8	10.7%	To take us on guided walks	5	9.4%
For safety/security	42	**56.0%**	For safety/security	24	45.3%
To give directions	25	33.3%	To give directions	15	28.3%
For lodging complaints about other behaviour	16	21.3%	For lodging complaints about other behaviour	14	26.4%
For site maintenance	39	52.7%	For site maintenance	31	58.5%
Other			Other		
Just to smile and say hi	1	1.3%	Check on behaviour	1	1.7%
			Monitor activities	1	1.7%

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g) Site Facilities & Management Issues Cont'd *Key Findings*

Stage 1: September 2001

During this first data collection stage,

- Only a small percentage of visitors identified Big Crystal as having special significance. The most frequent unprompted responses was because Big Crystal is regarded as one of the ***best swimming holes*** and because it is a ***National Park***;
- The majority of visitors, ***61.4%,*** either ***did not know*** or ***answered incorrectly*** as to who the management agency responsible for Big Crystal was;
- Of those who did identify an agency only ***38.6%*** identified ***National Parks*** (in its various formats) as the management agency;
- However, when provided with a choice, ***most visitors*** (74%) labelled Big Crystal a ***National Park*** and ***13%*** identified it as a ***National Park and World Heritage Area;***
- Most visitors preferred sites with ***fairly well developed facilities.***

Stage 2: April 2002

During this second data collection stage, visitor responses varied slightly.

- Fewer visitors considered Big Crystal to have special significance.
- Unprompted responses for this varied with the majority of visitors, ***59.6%,*** either ***not knowing*** or ***answering incorrectly*** as to who the management agency responsible for Big Crystal was;
- Of those who did identify an agency, ***40.4%*** identified ***National Parks*** (in its various formats) as the management agency;
- When provided with a choice, ***most visitors*** labelled Big Crystal a ***National Park***, and ***9.6%*** identified it as a ***National Park and World Heritage Area;***
- Again, most visitors preferred sites with ***fairly well developed facilities***.

Combined Data & General Comments

- The majority of visitors (60%) either ***did not know*** or provided an ***incorrect answer*** when asked who manages Big Crystal;
- When given a choice the majority, 73.6%, believed the site to be managed by ***National Parks***.
- Only 14.7% of visitors identified Big Crystal as a World Heritage Area.

1. *Visitors remain unfamiliar with the agency responsible for managing this site.*
2. *The World Heritage status is also not known by the vast majority of the visitors.*
3. *These results clearly suggest that the role of different land management agencies is not understood.*

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g) Site Facilities & Management Issues cont'd

QUESTIONS & RESULTS

23. Does this area you have visited today have any special status or significance that you are aware of ?

n = 76	Yes	15.8%	No	84.2%	***n = 51***	Yes	11.8%	No	88.2%

If yes, please specify:

n = 10	n		n	***n = 6***	n		n
Childhood memories	1	One of the best swimming holes	3	Beautiful scenery	1	National heritage	1
It's where our water comes from	1	World Heritage Area	1	Birth place of my mother	1	National Park	1
Natural environment	1	Tranquil / natural	1	Happy memories of my childhood	1	World Heritage Area	1
National Park	2						

24. What agency or department do you think manages this site?

n = 83	n	%	***n = 57***	n	%
Management Agency or Department:					
National Parks/Parks & Wildlife/QPWS	**32**	**38.6%**	**Management Agency or Department:**		
WTMA	2	2.4%	**National Parks/Parks & Wildlife/QPWS**	23	**40.4%**
Council	2	2.4%	Council	2	3.5%
Department of Environment	3	3.6%	DNR	1	1.7%
DNR	1	1.2%	DPI	1	1.7%
EPA	1	1.2%			
Government	1	1.2%	**Unanswered /Don't Know**	30	**52.6%**
Ingham	1	1.2%			
National World Heritage	1	1.2%			
Ergon Energy	1	1.2%			
Rangers	1	1.2%			
Reef HQ	1	1.2%			
Department of bush camping	1	1.2%			
Unanswered /Don't Know	35	**42.2%**			

25. Which of the following labels applies to this site?

n = 77	%		%	***n = 52***	%		%
National Park (NP)	**74.0%**	NP & WHA	13.0%	**National Park (NP)**	**73.1%**	NP & WHA	9.6%
State Forestry (SF)	0.0%	NP & SF	0.0%	State Forestry (SF)	0.0%	NP & SF	1.9%
World Heritage Area (WHA)	1.3%	SF & WHA	0.0%	World Heritage Area (WHA)	5.8%	SF & WHA	0.0%
Don't know	11.7%	NP, SF, WHA	0.0%	Don't know	9.6%	NP, SF, WHA	0.0%

26. Which of the following natural areas do you most prefer visiting?

n = 76	%	***n = 55***	%
Natural area with:		**Natural area with:**	
no facilities (eg. no toilets, no designated camp ground)	7.9%	no facilities (eg. no toilets, no designated camp ground)	7.3%
few facilities (eg. rough walking tracks)	10.5%	few facilities (eg. rough walking tracks)	9.1%
limited facilities (eg. walking tracks evident , some directional signage)	25.0%	limited facilities (eg. walking tracks evident , some directional signage)	25.5%
fairly well developed facilities (eg. well marked tracks, extensive signage)	**26.3%**	**fairly well developed facilities (eg. well marked tracks, extensive signage)**	**27.3%**
very well developed facilities (eg. camp grounds, visitor centre)	25.0%	very well developed facilities (eg. camp grounds, visitor centre)	18.2%
don't know/don't care	5.3%	don't know/don't care	12.7%

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h) Other Visitors & Experience ***Key Findings***

Stage 1: September 2001

During this first data collection stage,

- The majority of visitors ***did not agree*** that there were ***too many other people*** at Big Crystal;
- Visitors also ***did not agree*** that the people who were there ***impacted on their own behaviour or experience*** of the site;
- Two thirds of visitors ***agreed*** that other visitors at the site were on the whole ***environmentally responsible;***
- In terms of their experience of Big Crystal, visitors rated their ***enjoyment*** of the site ***highest*** with many strongly disagreeing that there were disappointing aspects;
- Most visitors ***mildly to somewhat agreed*** that their visit had been a ***special experience***.

Stage 2: April 2002

During this second data collection stage, visitor responses were lower on all items, which for the first two and last items means they were more positive about the social environment.

- Just over three quarters of visitors (76.4%) ***did not agree*** there were ***too many people*** at Big Crystal;
- Compared to Stage 1, more visitors ***strongly disagreed*** that the presence of other people ***impacted on their own behaviour and experience*** at the site;
- Just over two thirds of visitors ***agreed*** that other visitors to the site were on the whole ***environmentally responsible***;
- Visitors rated their ***enjoyment*** of the site ***highest*** , followed by the trip to the site being well ***worth the money spent***. Many visitors strongly disagreed that there were disappointing aspects at Big Crystal;
- Most visitors ***mildly to somewhat agreed*** that their visit was a ***special experience***.

Combined Data & General Comments

- The majority of visitors were not concerned about the number, presence or behaviour of people at Big Crystal;
- Visitor experience of the site was highest in terms of ***enjoyment*** and ***worth the money.***

1. *Experienced **crowding,** as measured by number, presence and behaviour of others, does not appear to be a problem at Big Crystal.*
2. *Reported visitor **satisfaction**, as measured by enjoyment and worth the money, was moderately high.*

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h) Other visitors

QUESTIONS & RESULTS

27. The following statements are about <u>other visitors</u> at this site today. Please rate how strongly you agree or disagree with each statement by circling one number for each statement.

	n	Strongly Disagree 1	2	3	4	5	Strongly Agree 6	$\overline{X}$
a) There were too many people at this site today.	79	26.6%	17.7%	24.1%	16.5%	6.3%	8.9%	*2.85*
	55	30.9%	20.0%	25.5%	7.3%	7.3%	9.1%	*2.67*
b) The presence of other people at this site prevented me from doing what I wanted to.	80	33.8%	25.0%	20.0%	6.3%	3.8%	11.3%	*2.55*
	55	49.1%	23.6%	12.7%	5.5%	5.5%	3.6%	*2.05*
c) The behaviour of other visitors at this site has been on the whole environmentally responsible.	79	5.1%	10.1%	19.0%	21.5%	24.1%	20.3%	*4.10*
	55	12.7%	10.9%	9.1%	20.0%	27.3%	20.0%	*3.98*
d) The behaviour of some visitors at this site detracted from my enjoyment of this site.	78	29.5%	24.4%	15.4%	12.8%	9.0%	9.0%	***2.74***
	55	**49.1%**	14.5%	29.1%	5.5%	1.8%	0.0%	***1.96***

i) Experience

QUESTIONS & RESULTS

28. The following statements are about your <u>experience</u> of this site. Please rate the extent to which you agree or disagree with each statement by circling one number.

	n	Strongly Disagree 1	2	3	4	5	Strongly Agree 6	$\overline{X}$
a) I experienced a real sense of involvement and connection with this place.	80	11.3%	12.5%	30.0%	32.5%	7.5%	6.3%	*3.31*
	56	1.8%	5.4%	23.2%	46.4%	10.7%	12.5%	*3.96*
b) For me visiting this site has been a special experience.	79	7.6%	8.9%	22.8%	32.9%	13.9%	13.9%	*4.29*
	55	0.0%	5.5%	18.2%	36.4%	25.5%	14.5%	*4.25*
c) I thoroughly enjoyed my visit to this site today.	79	2.5%	3.8%	5.1%	32.9%	27.8%	27.8%	*4.63*
	56	0.0%	0.0%	5.4%	26.8%	35.7%	32.1%	*4.95*
d) It was well worth the money I spent to come to this site.	76	9.2%	2.6%	7.9%	25.0%	25.0%	30.3%	*4.45*
	54	3.7%	0.0%	7.4%	18.5%	33.3%	37.0%	*4.89*
e) I was disappointed with some aspects of this site.	79	29.1%	17.7%	22.8%	21.5%	6.3%	2.5%	*2.66*
	56	39.3%	23.2%	19.6%	12.5%	1.8%	3.6%	*2.25*

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j) Additional Open-ended Items — *Key Findings*

Stage 1: September 2001

During this first data collection stage,

- **Additional information** requirements were predominantly related to ***maps and orientation*** information followed closely by ***cultural and historical*** information***;***
- While a number of aspects were identified as **enhancing visitor enjoyment**, most were related to ***natural features*** of the site in particular the creek and water holes;
- The most frequently reported aspects of the visit that **detracted from visitor experience** were related to the ***psychosocial aspects*** of the site in particular, the ***activities of other visitors.***

Stage 2: April 2002

During this second data collection stage, visitor responses differed slightly.

- **Additional information** requirements were predominantly related to ***natural and ecological*** information followed by ***cultural and historical*** information***;***
- Issues most frequently identified with **enhancing visitor enjoyment** were related to ***natural features*** – especially the waterholes;
- The most frequently reported aspects of the visit that **detracted from visitor experience** were those to do with the ***natural and biophysical aspects of the site,*** namely the mosquitoes.

Combined Data & General Comments

1. ***Maps and orientation information*** *was the type of additional information most frequently sought by visitors.*
2. *The* ***natural features*** at Big Crystal *were what enhanced visitor enjoyment of their visit.*
3. ***Behaviour of other visitors*** *and* ***insects*** *detracted from visitor enjoyment of Big Crystal.*

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k) Additional Open-Ended Items **Questions & Results**

18. If you were to visit this site again what additional information would you like?

Responses provided have been placed into five major categories. Information related to maps/orientation, natura/ecological information, cultural/historical information and general information.

Of the **17** respondents to this question, **7** indicated that no more additional information was required;

	n		n
Maps/Orientation		**Natural/Ecological/Geological**	
Walks / tracks	1	Environmental	1
More maps to toilets & waterhole	4	Wildlife	1 (1)
Where to camp	1	Name of plants	1
Rules/Regulations/Safety		**Cultural/Historical Information**	
Safety	(1)	Indigenous/cultural information	3
How many fish we can take home	1	History of area	1
Info on fires	2		
General:			
World Heritage info	1		

Of the **9** respondents to this question, **1** indicated that they would like no more additional information.

	n		n
Maps/Orientation		**Natural/Ecological**	
Timetable	1	Natural & Ecological / Environmental impact	2 (1)
		Wildlife/Plants/Habitation	2
Rules/Regulations/Safety			
General:		**Cultural/Historical Information**	
		Indigenous/cultural information	3

29. Were there any particular aspects of your visit that increased/enhanced your enjoyment of this site?

n = 75 Yes 24.0% No 76.0%

n = 55 Yes 27.3% No 72.7%

If yes, please specify:

	n		n
Natural:		**Social:**	
Naturalness of site	3	Being here with family / friends	3
The creek / water holes	7	Not too crowded	1
Good weather	1	**Other:**	
Facilities:		Cleanliness of site	(1)
Hot showers	1		

	n		n
Natural:		**Social:**	
Beautiful waterhole/ water /river/ waterfalls	10	Friends/ family present	1
Just nature	1	**Other:**	
Facilities:		The beer	1
The site provided opportunities for activities	1		
On site gas	1		

30. Were there any particular aspects of your visit that took away/detracted from your enjoyment of this site?

n = 77 Yes 22.1% No 77.9%

n = 56 Yes 28.6% No 71.4%

If yes, please specify:

	n		n
Natural/Biophysical:		**Facilities:**	
Lack of water	4	BBQs not at camp site	1
Manmade changes to water bed	1	Lack of shaded facilities	1
Mosquitoes	1	Toilets had an odour	1
		Other:	
Rules/Regulations/safety			
Social:			
Topless woman	3		
Activities of other visitors (loud music)	4		
Too many people	1		

	n		n
Natural/Biophysical:		**Facilities:**	
Mosquitoes	8	Retainer wall	1
Not enough wildlife	1		
Tadpoles	1	**Other:**	
Rules/Regulations/safety			
		Cigarette butts	2
		Filling out questionnaire	1
		Upstream rehab work	1

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Comments on Questionnaire *Key Findings*

The following are key findings in the comments made by visitors to Big Crystal

Stage 1: September 2001

- The majority of comments reflected visitors' negative experiences at the Big Crystal. Specifically, the ***facilities*** at the site were negatively commented on. Respondents wanted to know where the ***bins*** were as well as a ***tap in the picnic area.*** Visitors commented that the lack of a tap and the small size of the swimming area which detracted from their enjoyment of the site.

- Comments that suggested improvements with the site focused on:
  - bins being readily provided,
  - a tap being provided in the picnic area,
  - better toilet paper.

- Despite the majority of the comments being negative, the site was still described as being ***'relaxing'***.

Stage 2: April 2002

- Visitors again mainly commented on the ***negative aspects*** of the site.

- Comments mainly focused on the built environment and the natural environment.

- In regards to the built environment, the focus of comments was on the ***lack and condition of facilities***, especially the ***poor condition of the walking track***, and the ***absence of rubbish bins.***

- Comments on the natural environment focused on the flood wall in the creek appearing to be disturbed and impacted, as well as the presence of mosquitoes.

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Big Crystal: October 2001

ADDITIONAL COMMENTS MADE BY RESPONDENTS ON QUESTIONNAIRE

The following are comments made by 4 respondents who completed the questionnaire at Big Crystal.

Date	**Comments on site.**
06.10.01	Where's the bins? In reference to whether coming to site was worthwhile in terms of money spent: wouldn't say it was well worth it, but it was okay – relaxing. *(Australian visitor, gender: ?, age: ?).*
06.10.01	Dryness, fire damage to surrounds, no taps in picnic area and small swimming area all detracted from my enjoyment of this site. *(Australian visitor, male, age: ?)*
06.10.01	In terms of how I obtained prior information about this site: a man decided to go exploring one day. He found a great swimming hole one day and told his friends and family about it. Soon everybody knew about this hole: me included. *(Australian visitor, male, 14 years)*
06.10.01	Better toilet paper. *(Australian visitor, male, 16 years)*

Big Crystal: **April 2002**

ADDITIONAL COMMENTS MADE BY RESPONDENTS ON QUESTIONNAIRE

The following are comments made by some respondents who completed the questionnaire at Big Crystal

Date	Comments on Site.
13.04.02	Response to the site appears to be disturbed and impacted: The flood wall in the creek. *(Australian visitor, 50 years, female)*
14.04.02	This site provided opportunities for activities to be enjoyed by me and my family – as expected. In response to what aspects of your visit detracted from your enjoyment of this site: More people here than expected. More mosquitoes than experienced previously! *(Australian visitor, 41 years, female)*
14.04.02	Walking track to be upgraded. More or one rubbish bins would be nice. *(Australian visitor, 24 years, male)*

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COMMENTS AND OBSERVATIONS MADE BY FIELD SUPERVISOR

SITE : Big Crystal/Paradise Waterhole October 2001

The following key points have been extracted from the comments provided by the field supervisor.

- There were probably about 10 cars on the weekend which went straight to the rockslides and didn't visit the waterhole. Some of these were work vehicles.
- QPWS have car counters on the dirt access road. The past two weekends hey had had about 125 vehicles each w/e.
- Extra vehicles not counted as part of the survey would include rangers, water supply cars and rockslides only visitors and a few late comers.
- Visitors arrived throughout the day as early as 8am until dark.
- Mostly used by families and groups of young folk from Townsville. No tour groups. The young ones were less keen to fill out survey forms.
- There were about 36 Baptists camping there overnight for Friday and Saturday. About 20 filled out survey forms. They were the main users of the campground.
- Nearly everyone came to swim and headed straight for the waterhole. A few picnicked as well, especially on Sunday.
- The carpark was filled up once on Saturday and about 4 times on Sunday, leading to the odd drive through because there was no room. Capacity is about 18 cars. There is no room for more than one big bus.
- The track has been recently upgraded and bitumenised. The picnic area is having a new shelter shed built. The carpark has been changed to put in a circular road and bollards for parking, decreasing capacity, but stopping visitors doing wheelies.
- There was a ranger visit on both Saturday and Sunday. He went to the waterhole and rockslides.
- Because of vandalism and bad behaviour from local visitors after dark, the campground is locked each night. Keys and permits must be obtained from Townsville or Ingham QPWS.
- Rangers open and close the gates each morning and evening and check the toilets and facilities.
- No taps in picnic area for reasons unknown. Free bbqs were well used.
- The national park is in the WHA, but there were no WH signs to indicate this.
- There was a small amount of littering, but less than when the rangers provided rubbish bins. Bins are not a good option because the animals get into them, and people leave full rubbish bags there.
- Some feeding of birds took place while we were there. And Alicia got attacked by a Kookaburra (twice, she emphasises) which wanted her sandwich in her hand. Lots of meat and bread left lying around for animals after people had gone.
- Some speeding by young folks along the access road (more then 60) and around the carpark.
- A totally unself-conscious topless woman wandering the waterhole and picnic area offended a few people.

No ADDITIONAL COMMENTS were MADE BY RESPONDENTS TO FIELD ASSISTANTS

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BEHAVIOURAL EVENTS *Key Findings*

Combined Data Sets

From the behaviours recorded at Big Crystal in September 2001 and April 2002, the following behaviours were the most frequently observed.

Feeding Wildlife.

During both stages, visitors were observed feeding wildlife. In most cases, visitors were feeding bird life, specifically, turkeys and kookaburras. In one instance, a kookaburra stole some food from a lunch table where people were eating.

Although most other behaviours were varied, most of them could be regarded as ***inappropriate behaviour.*** For example in Stage 1, someone was observed urinating in the bushes and a lady was walking around the site topless, while in Stage 2, people were observed striping bark from trees. Littering was also observed.

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BEHAVIOURAL EVENTS

The following are critical incidental observations of behavioural events made opportunistically by field assistants during the period of administration of surveys and counts of vehicles/visitors.

Behavioural Topic	Comment : *OCTOBER 2001*	Comment: *April 2002*
Domestic Animals	• N/A	• N/A
Deliberate Damage to Plants	• N/A	14.04.02 • Picking bark from tree. 11.00 hrs.
Undesignated Area Use	06.10.01 • Urinating in bushes	• N/A
Speeding	06.10.01 • Three cars speeding in car park. 11.15 hrs.	• N/A
Risk Activity	• N/A	• N/A
Aggressive Behaviour	• N/A	• N/A
Other	06.10.01 • Wildlife attack. 12.25 hrs. • Littering: 13.05 hrs. Litter lying around. 11.20 hrs. 07.10.01 • Feeding wildlife. 12.30 hrs. • Inappropriate Behaviour: Topless lady walking around site.	13.04.02 • Interaction with wildlife: Lady and child feeding turkeys with bread. 10.54 hrs. Passenger stopped and took extra effort to avoid wildlife. 12.30 hrs. • Wildlife activity: Turkeys constantly scavenging/stealing food. 11.11 hrs. Kookaburra steals food from lunch table while people eating. 11.11 hrs. 14.04.02 • Interaction with wildlife: Feeding kookaburra. 11.11 hrs. • Wildlife activity: Turkey feeding. 11.11 hrs.

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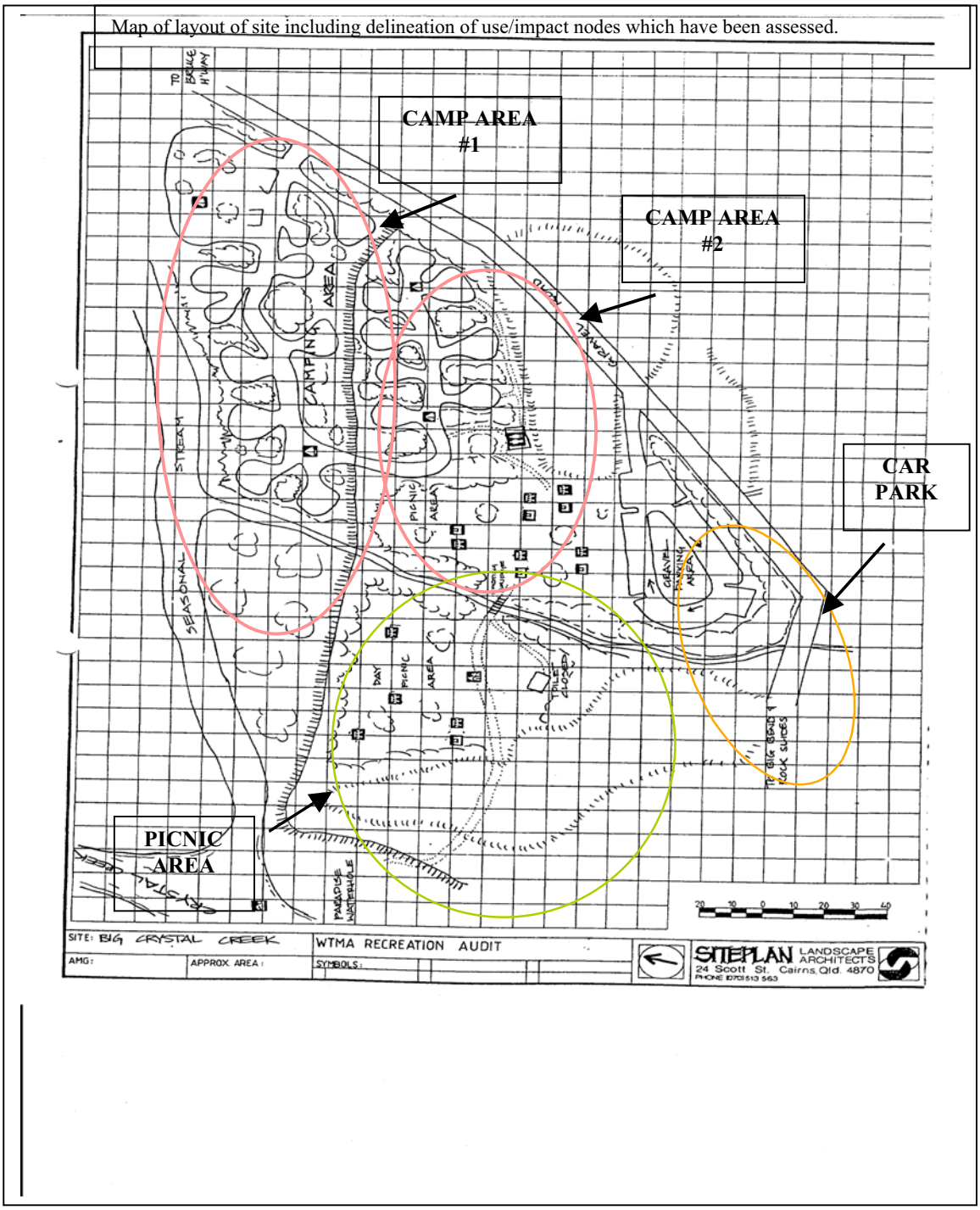
SECTION TWO

Section Two

Infrastructure Inventory and Profile

- Site Infrastructure Inventory
- Site Information and Signage

Figure 1: Big Crystal site map and activity nodes (Source: SitePlan 1993 modified to include the activity nodes).



Site Infrastructure Inventory *Key Findings*

The following table is a summary version of the inventory of features/facilities recorded at the three site activity nodes. An inventory was undertaken in 1999. For this current 2002 study it was not possible to update this inventory.

BIG CRYSTAL CREEK	Wet Tropics Site No. : 107 Management Agency: EPA/QPWS Date Assessed: 19/4/99			
Site Parameters				
Annual vehicle/visitor #	Vehicle s = 20,220; Visitors = 70,770 (WTMA 1996)			
Site Access:	Road			
Road Type:	Unsealed			
Road Conditions:	Severe erosion / few potholes			
	Car Park	**Picnic Area**	**Camp Area #1**	**Camp Area #2**
Facilities / Infrastructure				
Landscaping:	Medium	Hard	Hard	Hard
Signage:				
Corporate Identity	Absent	Absent	1	Absent
Visitor Orientation	Absent	Absent	Absent	Absent
Visitor Advice	1	4	2	1
Regulatory	1	Absent	Absent	Absent
Interpretative	Absent	Absent	Absent	Absent
Foreign Language	Absent	Absent	Absent	Absent
Capacity / Description:	Gravel	50 x 50m Approx 16 seating spaces	8 camping sites	-
Amenities / Utilities				
Toilets:	Absent	Absent	Absent	6 septic
Showers:	Absent	Absent	Absent	4 cold
Bins:	Absent	Absent	Absent	2 bins
Water:	Absent	Absent	Must be boiled	Must be boiled
Power:	Absent	Absent	Absent	Absent
Telephone:	Absent	Absent	Absent	Absent
Other	Absent	2 basins, 3 gas BBQs 4 tables,	3 tables	3 tables
Appeal				
Attractiveness:				
Naturalness (within)	Low	Medium	Medium	Low
Naturalness (surroundings)	Medium	Medium	Medium	Low - exotic weeds
Nuisance insects	High	High	High	High
Built environment	Medium	Medium	Low	Low
Shade	40%	60%	60%	50%
Noise (human origin):	Low	Low	Nil	Nil
Biophysical				
Landform:	Level	Level	Level	Level
Altitude:				
Vegetation:	Sclerophyll	Sclerophyll	Eucalypts, acacia, cocky apple	Sclerophyll
Geology:	Granites	Granites	Granites	Granites
Water body:	Absent	Absent	River	Nil
Impact Assessment				
Condition Indicators:				
Litter (visual impact)	Low	Low	Medium	Nil
Litter (amount)	<5 items	<5 items	6-20 items	<5 items
Litter (type)	-	Foodscraps, paper, plastic	Paper	Paper
Waste Management	Not applicable	Not applicable	Not applicable	Not applicable
Wear on facilities	High	Medium	High	High
Vandalism / graffiti	medium	Medium	Medium	High
Environmental Indicators:				
Soil erosion	Low	Medium	Low	Medium - high
Exotic weeds	High	High	High - grass, weeds, vines	High
Exotic ornamentals	Nil	Nil	Nil	Nil
Vegetation	Medium breakage, low mutilation	Medium breakage, medium mutilation	Medium breakage, high mutilation	Medium breakage, high mutilation
Wildlife	No evidence of habituation	2 habituated scrub turkeys	2 scrub turkeys, 2 kookaburras, habituated	No evidence of habituation.
Additional Notes Weed infestation at this site is extensive.	No formal parking bays.	Sandflies, march flies and mosquitoes bad.	Bollards need replacing, tables need painting. Extensive weed infestation, evidence of prior poisoning.	Weed infestation severe, 1-2m high. Brown pigeon, kookaburra seen. Some new bollards.

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Site Infrastructure Inventory

A detailed inventory was not undertaken during this study period, however a selection of photos were taken. These are presented together with a general comment about each of the activity nodes at this site.

A. Day Use Area

Car Park: The car park services both the picnic area and the walking track to Paradise waterhole. It is separated from the picnic area by bollards. Road section of car park is sealed but the parking bays are unsealed.

Picnic Area: There is one clearly defined day use/picnic area which is separate from the camp area. This area contains picnic tables, seats, rubbish bins, and gas bbqs.

Car Park

Picnic Area

Picnic Area

Shelter/Change Shed

BBQ

Tap

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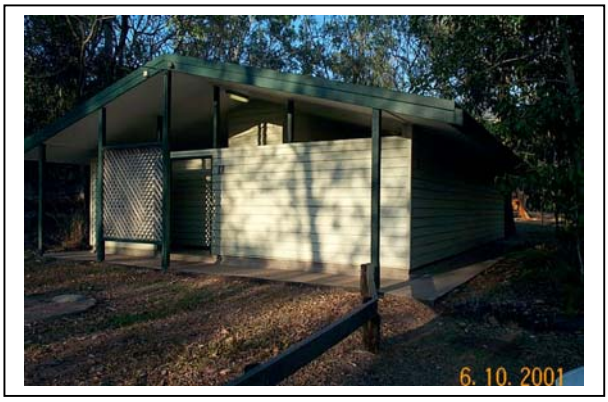
B. Camping Area

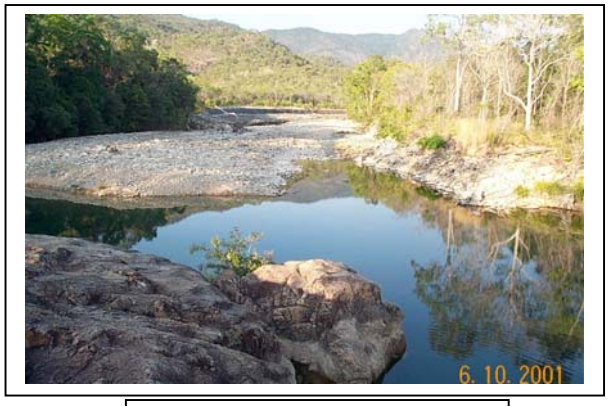
Amenities Area: A toilet block is situated between the day use and camping area

Camp Area: Three broad camp areas are defined by a vehicle track; no numbered camp sites; no defined parking areas; no vehicle barriers; Camp registration; Camping area has a locked gate.



Toilet Block

C. Paradise Waterhole & Rockslides



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Site Information and Signage

A detailed inventory of signage at this site was not undertaken during this study period. Nevertheless, a selection of photos provides an overview of the type of signage present.

Access Road

Day Use / Picnic Area/Car Park Signage

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Camping Area Signage

Walking Track Signage

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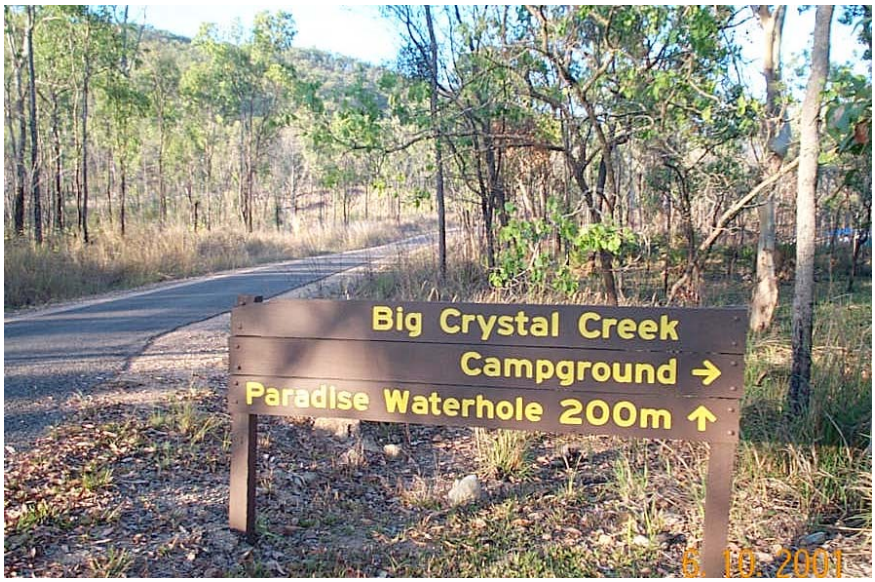
SECTION THREE

Section Three

Vehicle and Visitor Monitoring



- Vehicle and Visitor Records
- Traffic Counter Data

Vehicle and Visitor Records: *Big Crystal*

Summary table of visitor and vehicle records established over four x eight hour observation periods.

	Visitors					Vehicles				
	Visitor Type	**# in 8hrs**	**# per vehicle**	**Highest # at one time**	**Time**	**Vehicle Type**	**# in 8hrs**	**Highest # at one time**	**Time**	**Average Length of Stay**
6 Oct 2001	Groups /Family 61%	164	3.49	80	1330	cars (86%)	47	20	1330	144mins
7 Oct		165	3.17	55	1400		52	15	1400	87mins
13 April 2002	Couples	40	2.5	9	1030	cars (58%) 4WD (48%)	16	4	1045	49mins
14 April		118	3.69	85	1430		32	20	1430	132mins

Traffic Counter Data: *Big Crystal*

Summary table of traffic counter data for a twelve month period (September 2001-2002).

	Visitors					Vehicles		
	Average #	**Highest #**	**Time 0f Highest**	**Lowest #**	**Time 0f Lowest**	**Average #**	**Highest #**	**Lowest #**
Yearly	**47,992**					**13,481**		
Monthly	3,977	9,530	January 2002	2,421	June 2002	1,117	2,677	680
Weekly	1,206	2,830	December 2001 Week 4	402	February 2002 Week 2	258	795	113
Daily : Weekdays	96	1047	28th January 2002	4	19th February 2002	27	294	1
Daily: Weekends	221	716	27th January 2002	14	16th February 2002	62	201	4

Vehicle and Visitor Records *Key Findings*

Data for these records were established from eight hours of continuous observations of vehicles and vehicle occupancy during each day of the survey distribution periods, Stage 1 (6th & 7h October2001) and Stage 2 (13th & 14th April 2002). This is the first time this type of data has been collected at Big Crystal and so previous data is unavailable for comparative purposes.

Stage 1: 6th and 7th October 2001

Pattern of access to and use of Big Crystal: Figure 1

General

- ***Vehicle Type:*** The majority of vehicles using the site over the two days of observation were ***cars (86%).*** There were ***no commercial coaches/buses*** using Big Crystal during this period.
- ***Visitor Category:*** Big Crystal appears to be favoured by ***independent visitors*** with groups of three and four making up the major visitor category over these two days (61%).

Day 1 (6h October 2001 - Saturday)

- A total of 1***64 people*** in ***47 vehicles*** visited Big Crystal during this eight hour observation period.
- There was ***one distinct peak*** in visitor numbers around ***1330 hours***;
- The highest number of visitors at the site at any one time was ***80 at 1330 hours***. Visitor numbers remained at around 50 and above from between 1000 and 1630 hours.
- The highest number of vehicles at the site at any one time was ***20 at 1330 hours***. For most of the day number of vehicles at the site remained above 10 (1000 and 1700 hours).

Day 2 (7th October 2001 - Sunday)

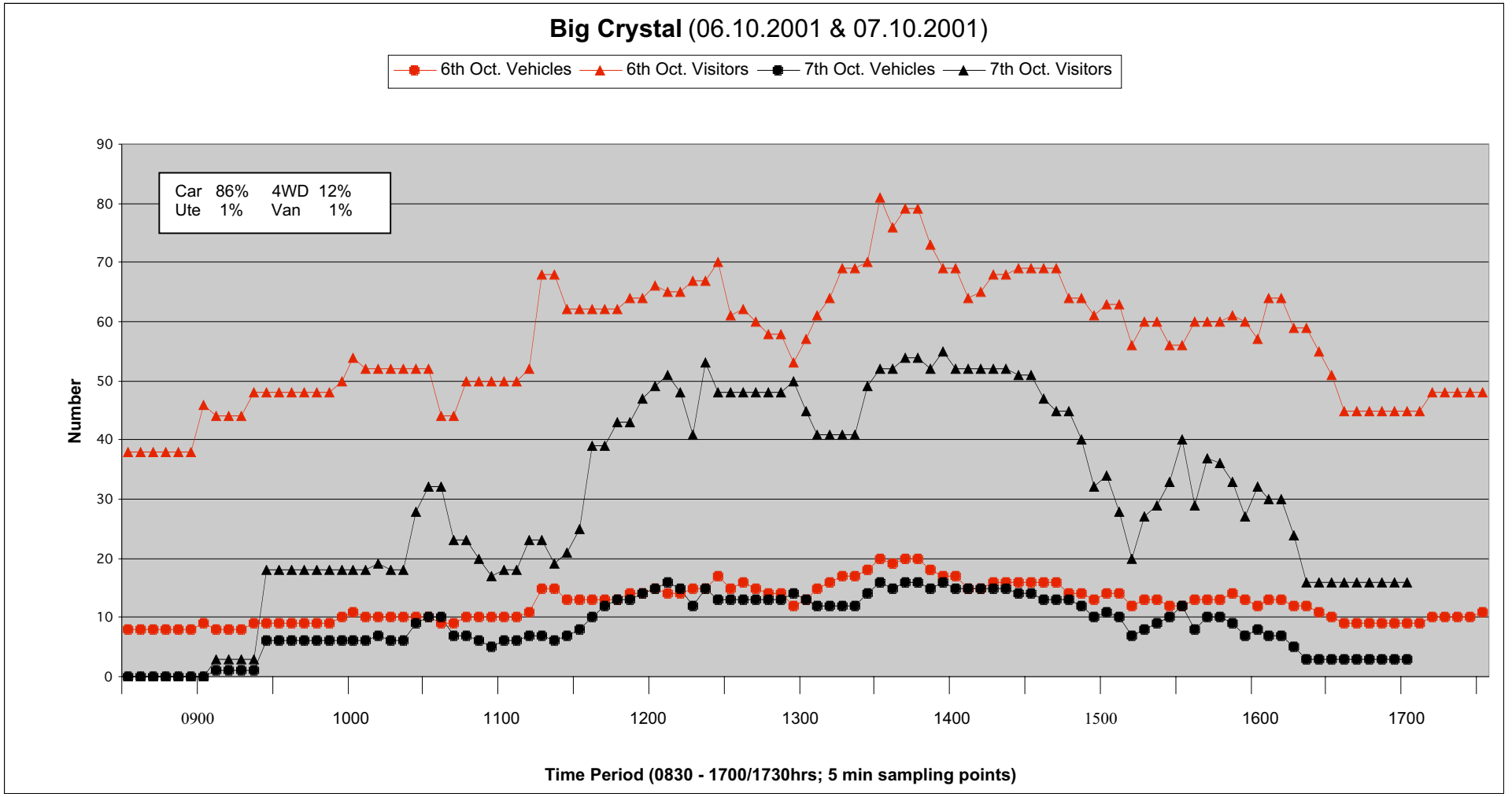
- A total of ***165 people*** in ***52 vehicles*** visited Big Crystal during this eight hour observation period.
- There was ***one distinct peak*** in visitor numbers ***at 1400 hours.***
- The highest number of visitors at the site at any one time was ***55 at 1400 hours***. For most of the day the number of visitors at the site at any one time remained above 20. Between 1330 and 1430 hours visitor numbers were between 50 and 55.
- The highest number of vehicles at the site at any one time was ***15 at 1400 hours***. From between 1130 and 1500 hours vehicle numbers remained above 10.

Length of Stay : Figures 2 and 3

- While there were fewer vehicles observed at the site on Day 1 (47 vehicles) compared to Day 2 (52 vehicles), there were equal numbers of people (164 visitors Day 1, 165 visitors Day 2).
- The average length of stay was ***144 minutes*** on Day 1, and ***87 minutes*** on Day 2.
- On Day 1, 53% of the vehicles stayed longer than one hour. On Day 2 this had increased to 60%.

VEHICLE AND VISITOR DATA: ***BIG CRYSTAL***

Figure 1: Records for vehicles and visitors over two x eight hour periods at Big Crystal.



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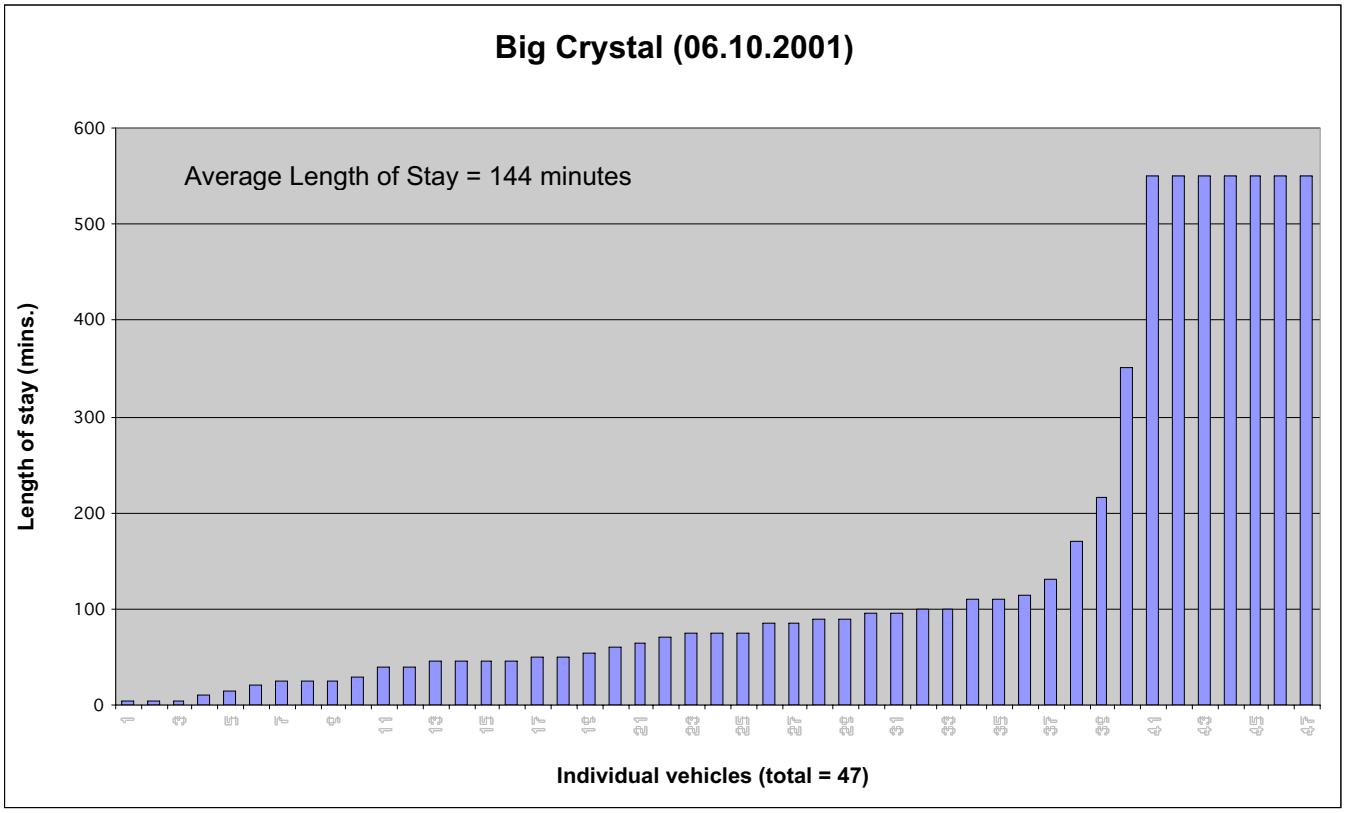


Figure 2: Length of stay of each vehicle at Big Crystal on Day 1 (06.10.2001).

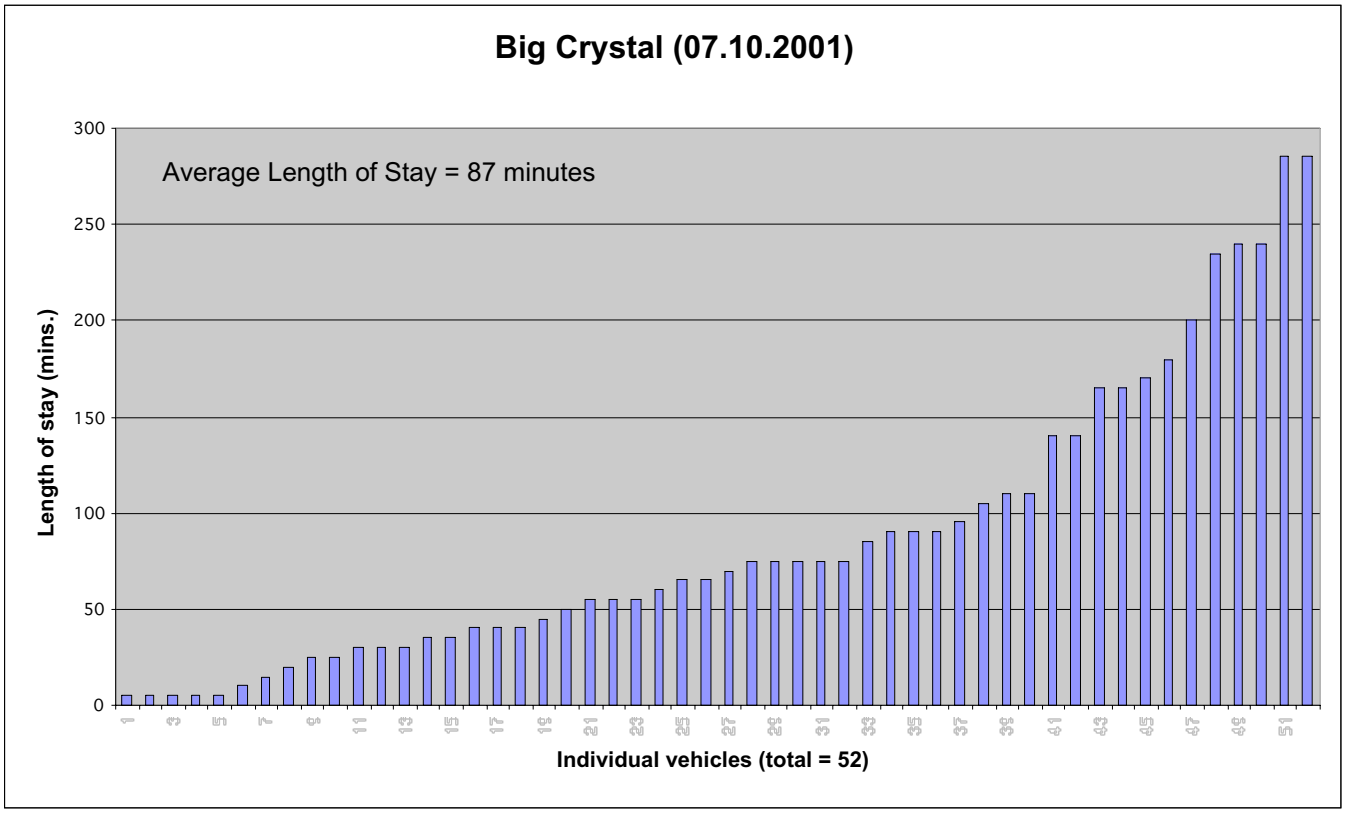


Figure 3: Length of stay of each vehicle at Big Crystal on Day 2 (07.10.2001).

Vehicle and Visitor Records *Key Findings*

Stage 2: 13th and 14th April 2002

Pattern of access to and use of Big Crystal: Figure 4

General

- ***Vehicle Type:*** The majority of vehicles using the site over the two days of observation were ***cars (58%)*** and ***4WD (48%).*** There were ***no commercial coaches/buses*** using Big Crystal during this period.
- ***Visitor Category:*** Big Crystal appears to be favoured by independent visitors with couples making up the major visitor category over these two days.

Day 1 (13th April 2002 - Saturday) ***A quiet day***

- A total of ***40 people*** in ***16 vehicles*** visited Big Crystal during this eight hour observation period.
- There was ***one distinct peak*** in visitor numbers between ***1030 and 1100 hours***;
- The highest number of visitors at the site at any one time was ***9 at 1030 hours***. Visitor numbers remained at around 5 for most of the day, a very quite day.
- The highest number of vehicles at the site at any one time was ***4 at 1045 hours***. For most of the day number of vehicles at the site remained below 5.

Day 2 (14th April 2002 - Sunday) ***A much busier day***

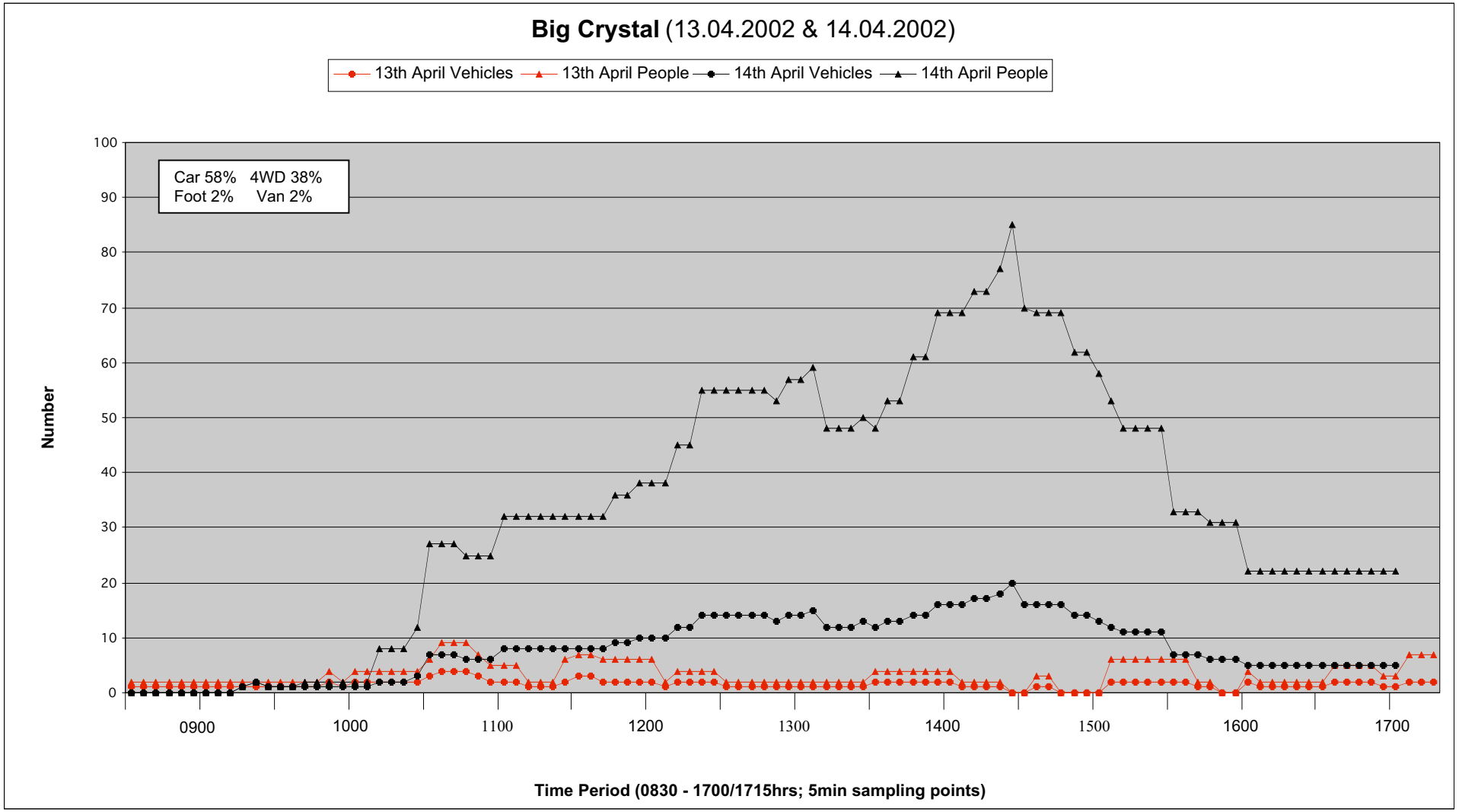
- A total of ***118 people*** in ***32 vehicles*** visited Big Crystal during this eight hour observation period.
- There was ***one distinct peak*** in vehicle and visitor numbers ***at 1430hours.***
- The highest number of visitors at the site at any one time was ***85 at 1430hours***. Between 1200 and 1530 hours number of visitors at the site at any one time remained above 40.
- The highest number of vehicles at the site at any one time was ***20 at 1430 hours***. From between 1200 and 1530 hours vehicle numbers remained between 10 and 20.

Length of Stay: Figures 5 and 6

- There were significantly fewer vehicles observed at the site on Day 1 (16 vehicles) compared to Day 2 (32 vehicles), and people (40 visitors Day 1, 118 visitors Day 2).
- The average length of stay was ***49 minutes*** on Day 1, and ***132 minutes*** on Day 2.
- On Day 1, 6% of the vehicles stayed longer than one hour. On Day 2 this had increased to 66%.

VEHICLE AND VISITOR COUNT DATA: ***BIG CRYSTAL***

Figure 4: Records for vehicles and visitors over two x eight hour periods at Big Crystal.



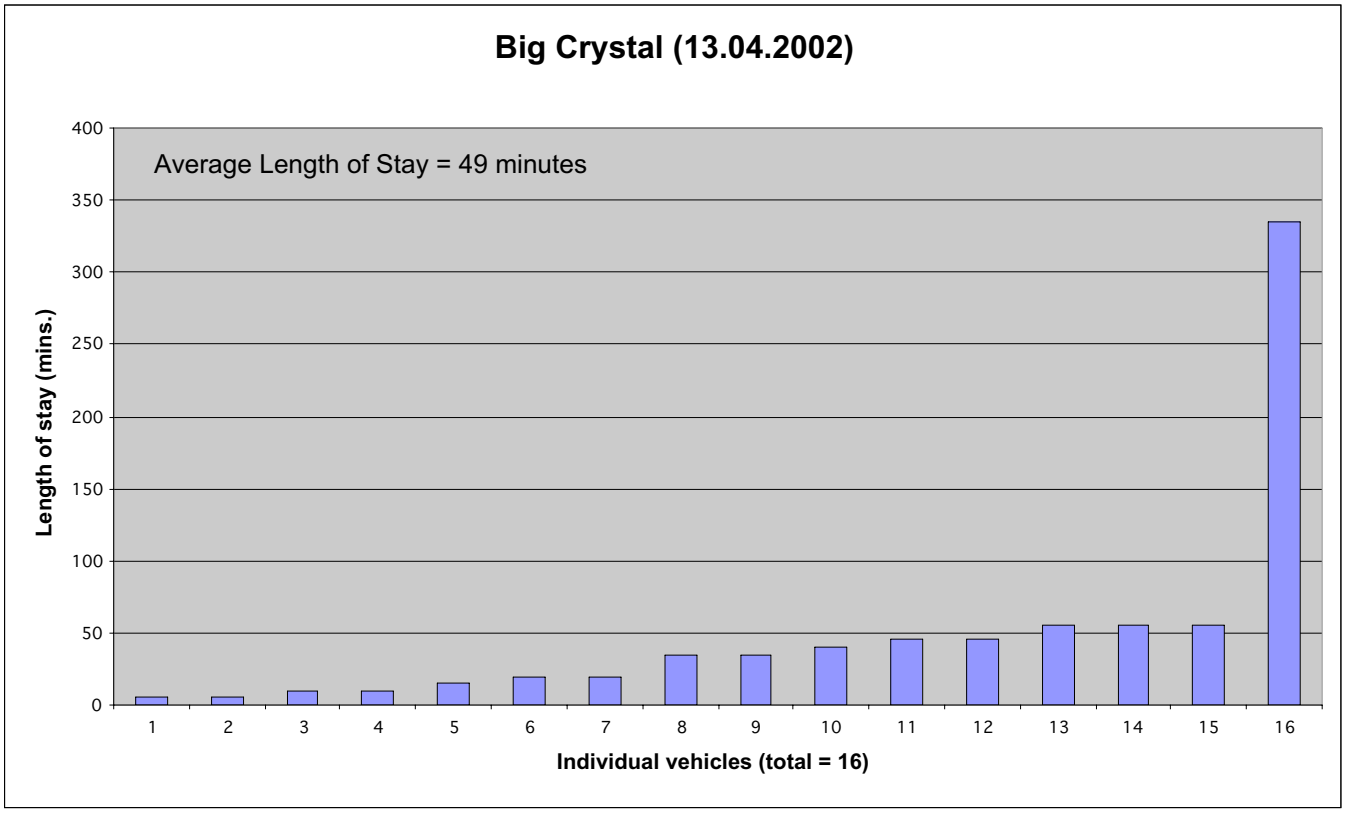


Figure 5: Length of stay of each vehicle at Big Crystal on Day 1 (13.04.2002).

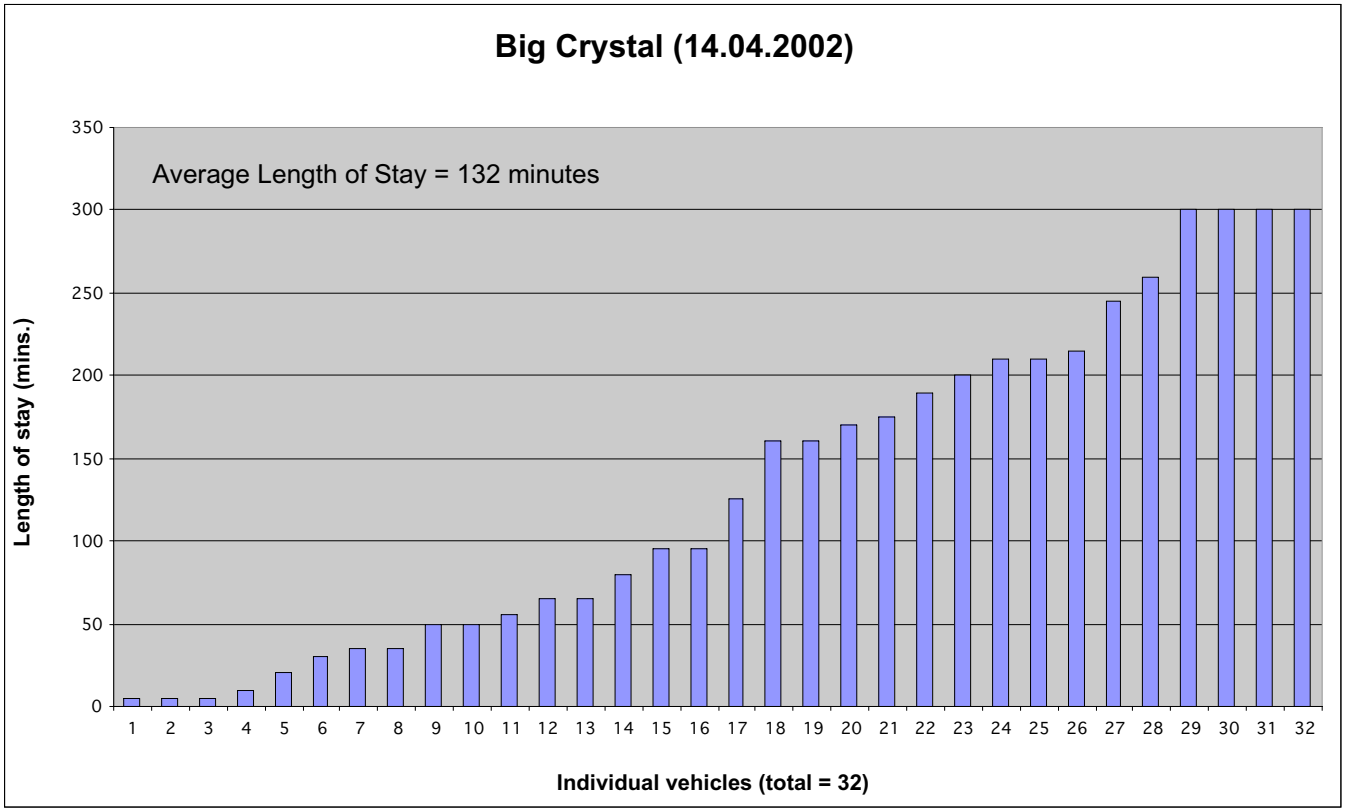


Figure 6: Length of stay of each vehicle at Big Crystal on Day 2 (14.04.2002).

*T*raffic Counter Data *Key Findings*

The traffic counter was installed at Big Crystal for 12 months (September 2001 – September 2002). The following key findings are associated with this data set.

Yearly Estimates: 13,481 vehicles and 47,992 visitors

Monthly Records : Figure 7

- On average, ***1,117 vehicles*** (range = 680 – 2,677) and ***3,977 people*** (range = 2,421 – 9,530) visited Big Crystals each month.
- The mid summer months ***December 2001 and January 2002*** received the ***highest*** visitation rates during which time vehicle numbers exceeded 1,500. January was particularly busy compared to other months. The quietest months were May, June and July2002, the winter months.

Weekly Records: Figure 8

- On average, ***258 vehicles*** (range = 113 – 795) and ***1,206 people*** (range = 402 –2,830) visit Big Crystal each week.
- There were two discernible periods of increased vehicular traffic levels recorded during sampling: ***December*** (week 4) and ***January*** (week 1).
- The highest number of vehicles and visitors was in ***December 2001, Week 4,*** during which week ***795 vehicles and 2,830 visitors*** used this site.

Daily Records : Figure 9 and Table 1

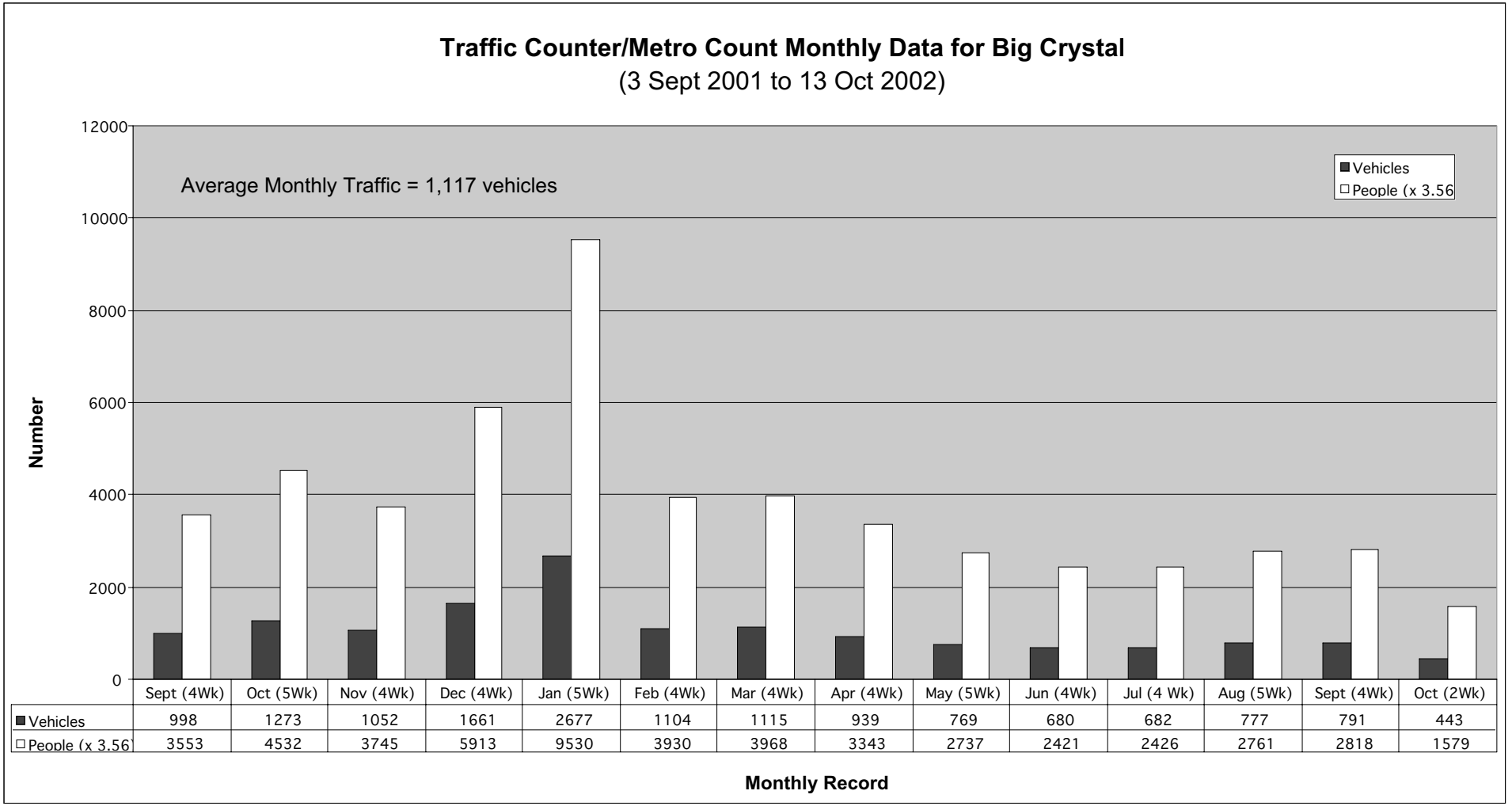
- On average, ***37 vehicles*** (range = 1 – 294) and ***132 people*** (range = 4 – 1047) visited Big Crystal each day.
- During the week little change in visitation rates occurred - ***Average weekday use = 27 vehicles per day.***
- Highest number of visits in a one day period occurred on 28th January 2002, Australia Day holiday (294 vehicles and 1,047 visitors).
- Weekends were busier than weekdays with Sunday recording, on average, 78 vehicles (range 21 – 201), and 279 people (highest number = 716 people on 27th January 2002). Sunday visitation rates considerable higher compared to Saturday -***Average weekend use = 62 vehicles per day.***

Comparative Traffic Counter Data

Estimated visitor use at Big Crystal 1992/93: ***(Source: Manidis Roberts 1993/94)***

a. Yearly estimates vehicles = 20,293; people = 65,774 (calculated on 3.24 people per vehicle)
b. Average weekend use 114.7 (wet), 71.5 (dry)
c. Average weekday use 16.5 (wet), 27.2 (dry)

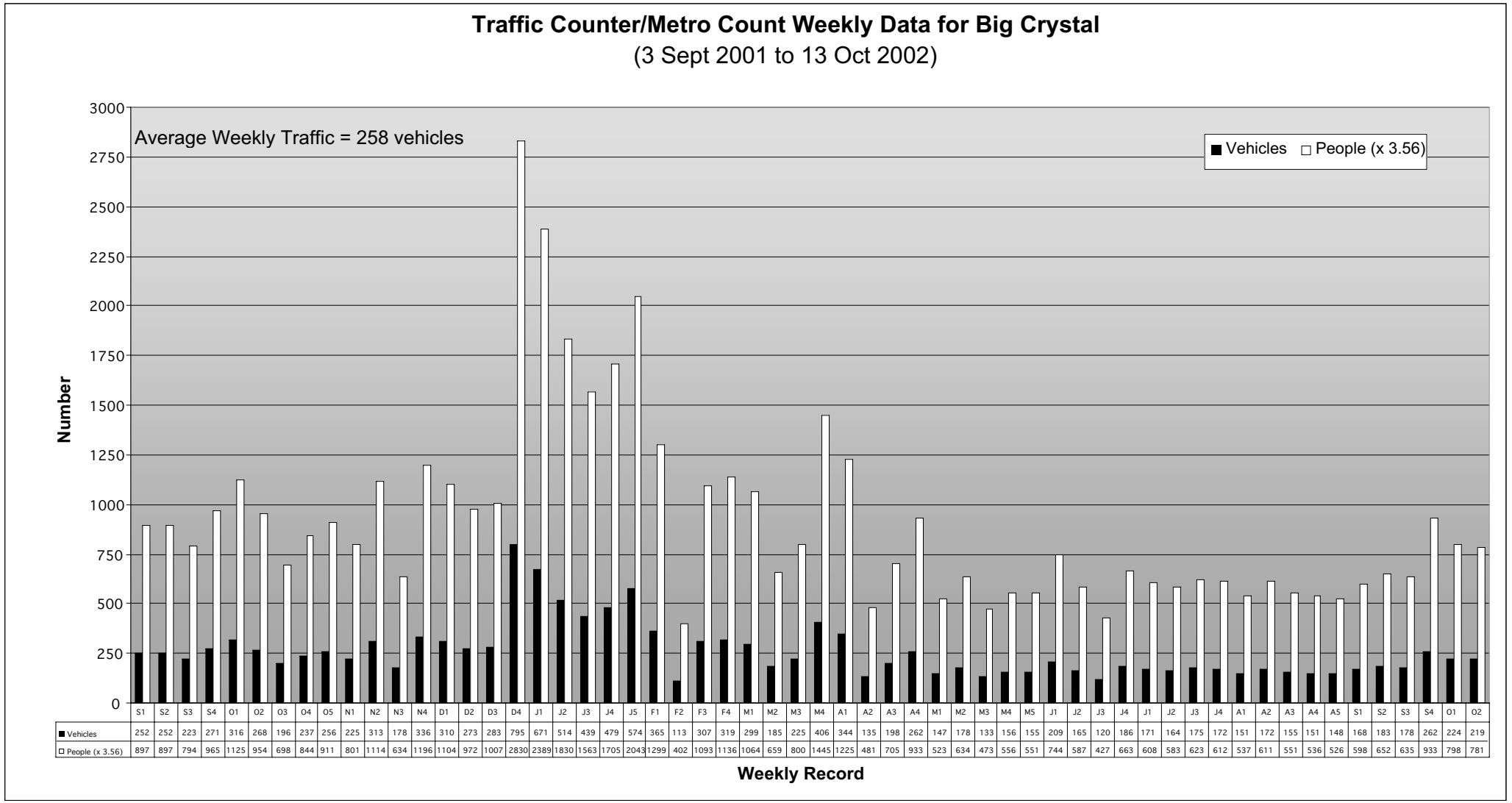
TRAFFIC COUNTER/METRO COUNT DATA: ***BIG CRYSTAL***



	Sept (4Wk)	Oct (5Wk)	Nov (4Wk)	Dec (4Wk)	Jan (5Wk)	Feb (4Wk)	Mar (4Wk)	Apr (4Wk)	May (5Wk)	Jun (4Wk)	Jul (4 Wk)	Aug (5Wk)	Sept (4Wk)	Oct (2Wk)
Vehicles	998	1273	1052	1661	2677	1104	1115	939	769	680	682	777	791	443
People (x 3.56)	3553	4532	3745	5913	9530	3930	3968	3343	2737	2421	2426	2761	2818	1579

Figure 7: Monthly Records for Vehicles and Visitors at Big Crystal.

TRAFFIC COUNTER/METRO COUNT DATA: ***BIG CRYSTAL***



	S1	S2	S3	S4	O1	O2	O3	O4	O5	N1	N2	N3	N4	D1	D2	D3	D4	J1	J2	J3	J4	J5	F1	F2	F3	F4	M1	M2	M3	M4	A1	A2	A3	A4	M1	M2	M3	M4	M5	J1	J2	J3	J4	J1	J2	J3	J4	A1	A2	A3	A4	A5	S1	S2	S3	S4	O1	O2
Vehicles	252	252	223	271	316	268	196	237	256	225	313	178	336	310	273	283	795	671	514	439	479	574	365	113	307	319	299	185	225	406	344	135	198	262	147	178	133	156	155	209	165	120	186	171	164	175	172	151	172	155	151	148	168	183	178	262	224	219
People (x 3.56)	897	897	794	965	1125	954	698	844	911	801	1114	634	1196	1104	972	1007	2830	2389	1830	1563	1705	2043	1299	402	1093	1136	1064	659	800	1445	1225	481	705	933	523	634	473	556	551	744	587	427	663	608	583	623	612	537	611	551	536	526	598	652	635	933	798	781

Figure 8: Weekly Records for Vehicles and Visitors at Big Crystal.

TRAFFIC COUNTER/METRO COUNT DATA FOR ***BIG CRYSTAL***

Table 1: Daily Records of Vehicles and Visitors at Big Crystal.

SEPTEMBER 2001 Data highlighted in yellow are daily averages for this month.
Traffic counter was not installed until Week 3.

2001	**MON** Vehicles	*People*	**TUE** Vehicles	*People*	**WED** Vehicles	*People*	**THU** Vehicles	*People*	**FRI** Vehicles	*People*	**SAT** Vehicles	*People*	**SUN** Vehicles	*People*
Wk 1 3-9Sept	23	*82*	34	*121*	41	*146*	32	*114*	17	*61*	47	*167*	58	*206*
Wk 2 10-16Sept	23	*82*	34	*121*	41	*146*	32	*114*	17	*61*	47	*167*	58	*206*
Wk 3 17-23Sept	18	*64*	30	*107*	39	*139*	27	*96*	15	*53*	45	*160*	52	*185*
***Wk 4 24-30Sept**	27	*96*	37	*132*	42	*150*	36	*128*	19	*68*	48	*171*	64	*228*

OCTOBER 2001

2001	**MON** Vehicles	*People*	**TUE** Vehicles	*People*	**WED** Vehicles	*People*	**THU** Vehicles	*People*	**FRI** Vehicles	*People*	**SAT** Vehicles	*People*	**SUN** Vehicles	*People*
***Wk 1 1-7Oct**	32	*114*	23	*82*	37	*132*	41	*146*	41	*146*	68	*242*	75	***267***
Wk 2 8-14Oct	34	*121*	22	*78*	23	*82*	22	*78*	20	*71*	56	*199*	92	*328*
Wk 3 15-21Oct	19	*68*	15	*53*	5	*18*	17	*61*	25	*89*	65	*231*	51	*182*
Wk 4 22-28Oct	22	*78*	15	*53*	19	*68*	17	*61*	19	*68*	62	*220*	84	*299*
Wk 5 29-4 Nov	18	*64*	19	*68*	29	*103*	20	*71*	25	*89*	53	*189*	94	*335*

NOVEMBER 2001

2001	**MON** Vehicles	*People*	**TUE** Vehicles	*People*	**WED** Vehicles	*People*	**THU** Vehicles	*People*	**FRI** Vehicles	*People*	**SAT** Vehicles	*People*	**SUN** Vehicles	*People*
Wk 1 5-11Nov	13	*46*	18	*64*	17	*61*	17	*61*	21	*75*	48	*171*	94	*335*
Wk 2 12-18Nov	22	*78*	32	*114*	38	*135*	17	*61*	21	*75*	58	*206*	126	*449*
Wk 3 19-25Nov	21	*75*	12	*43*	18	*64*	13	*46*	11	*39*	36	*128*	68	*242*
Wk 4 26-2Dec	21	*75*	15	*53*	30	*107*	31	*110*	24	*85*	69	*246*	148	*527*

DECEMBER 2001 Blue = Public Holidays

2001	**MON** Vehicles	*People*	**TUE** Vehicles	*People*	**WED** Vehicles	*People*	**THU** Vehicles	*People*	**FRI** Vehicles	*People*	**SAT** Vehicles	*People*	**SUN** Vehicles	*People*
Wk 1 3-9Dec	17	*61*	32	*114*	28	*100*	27	*96*	27	*96*	46	*164*	134	*477*
Wk 2 10-16Dec	23	*82*	27	*96*	39	*139*	17	*61*	30	*107*	34	*121*	105	*374*
***Wk 3 17-23Dec**	31	*110*	42	*150*	37	*132*	25	*89*	27	*96*	56	*199*	66	*235*
***Wk 4 24-30Dec**	36	*128*	80	*285*	173	*616*	110	*392*	130	*463*	118	*420*	150	*534*

JANUARY 2002 Blue = Public Holidays

2002	MON		TUE		WED		THU		FRI		SAT		SUN	
	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*
***Wk 1 31Dec-6Jan**	54	*192*	203	*723*	72	*256*	71	*253*	65	*231*	74	*263*	134	*477*
***Wk 2 7-13Jan**	43	*153*	47	*167*	71	*253*	57	*203*	64	*228*	97	*345*	136	*484*
***Wk 3 14-20Jan**	34	*121*	61	*217*	51	*182*	58	*206*	43	*153*	70	*249*	125	*445*
***Wk 4 21-27Jan**	36	*128*	35	*125*	44	*157*	49	*174*	30	*107*	85	*303*	201	*716*
Wk 5 28-3Feb	294	*1047*	26	*93*	21	*75*	21	*75*	25	*89*	61	*217*	128	*456*

FEBRUARY 2002

2002	MON		TUE		WED		THU		FRI		SAT		SUN	
	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*
Wk 1 4-10Feb	13	*46*	19	*68*	20	*71*	23	*82*	23	*82*	105	*374*	163	*580*
Wk 2 11-17Feb	13	*46*	27	*96*	12	*43*	2	*7*	7	*25*	4	*14*	49	*174*
Wk 3 18-24Feb	12	*43*	1	*4*	35	*125*	36	*128*	23	*82*	56	*199*	144	*513*
Wk 4 25-3Mar	14	*50*	21	*75*	18	*64*	18	*64*	17	*61*	67	*239*	166	*591*

MARCH 2002 Data highlighted in yellow are the daily averages for this month.

2002	MON		TUE		WED		THU		FRI		SAT		SUN	
	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*
Wk 1 4-10Mar	11	*39*	11	*39*	19	*68*	20	*71*	24	*85*	81	*288*	135	*480*
Wk 2 11-17Mar	12	*43*	11	*39*	11	*39*	16	*60*	19	*68*	44	*157*	72	*256*
Wk 3 18-24Mar	13	*46*	12	*43*	15	*53*	15	*53*	12	*43*	74	*263*	84	*299*
Wk 4 25-31Mar	13	*46*	15	*53*	13	*46*	25	*89*	117	*417*	97	*345*	128	*456*

APRIL 2002 Blue = Public Holidays

2002	MON		TUE		WED		THU		FRI		SAT		SUN	
	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*
***Wk 1 1-7Apr**	108	*384*	26	*93*	32	*114*	37	*132*	26	*93*	56	*199*	61	*217*
Wk 2 8-14Apr	19	*68*	16	*57*	10	*36*	8	*28*	12	*43*	24	*85*	47	*167*
Wk 3 15-21Apr	9	*32*	12	*43*	15	*53*	27	*96*	21	*75*	43	*153*	72	*256*
Wk 4 22-28Apr	20	*71*	34	*121*	17	*61*	92	*328*	15	*53*	39	*139*	46	*164*

MAY 2002 Blue = Public Holidays

2002	MON		TUE		WED		THU		FRI		SAT		SUN	
	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*
Wk 1 29-5May	12	*43*	15	*53*	17	*61*	15	*53*	10	*36*	29	*103*	51	*182*
Wk 2 6-12May	58	*206*	12	*43*	11	*39*	11	*39*	14	*50*	26	*93*	47	*167*

Wk 3 13-19May	20	*71*	21	*75*	15	*53*	16	*57*	9	*32*	21	*75*	33	*117*
Wk 4 20-26May	19	*68*	17	*61*	13	*46*	18	*64*	11	*39*	36	*128*	42	*150*
Wk 5 27-07Jun	29	*103*	18	*64*	18	*64*	22	*78*	16	*57*	22	*78*	30	*107*

JUNE 2002 Blue = Public Holidays

2002	**MON**		**TUE**		**WED**		**THU**		**FRI**		**SAT**		**SUN**	
	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*
Wk 1 03-09Jun	18	*64*	35	*125*	22	*78*	21	*75*	26	*93*	33	*117*	54	*192*
Wk 2 10-16Jun	59	*210*	24	*85*	8	*28*	19	*68*	15	*53*	19	*68*	21	*75*
Wk 3 17-23Jun	15	*53*	12	*43*	13	*46*	17	*61*	11	*39*	22	*78*	30	*107*
***Wk 4 24-30Jun**	17	*61*	25	*89*	20	*71*	25	*89*	37	*132*	22	*82*	39	*139*

JULY 2002 Data highlighted in yellow are daily averages for this month.

2002	**MON**		**TUE**		**WED**		**THU**		**FRI**		**SAT**		**SUN**	
	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*
***Wk 1 01-07Jul**	18	*64*	23	*82*	33 Tsv	*117*	23	*82*	24	*85*	25	*89*	25	*89*
Wk 2 08-14Jul	15	*53*	19	*68*	24	*85*	24	*85*	22	*78*	23	*82*	37	*132*
Wk 3 15-21Jul	22	*78*	25	*89*	13	*46*	28	*100*	27 Cns	*96*	29	*103*	31	*111*
Wk 4 22-28Jul	24	*85*	22	*78*	20	*71*	27	*96*	21	*75*	21	*75*	37	*132*

AUGUST 2002

2002	**MON**		**TUE**		**WED**		**THU**		**FRI**		**SAT**		**SUN**	
	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*
Wk 1 29-04Aug	15	*53*	21	*75*	14	*50*	21	*75*	22	*78*	24	*85*	34	*121*
Wk 2 05-11Aug	23	*82*	15	*53*	29	*103*	18	*64*	15	*53*	32	*114*	40	*142*
Wk 3 12-18Aug	31	*110*	17	*61*	18	*64*	17	*60*	20	*71*	30	*107*	22	*78*
Wk 4 19-25Aug	11	*39*	6	*21*	15	*53*	13	*46*	13	*46*	23	*82*	70	*249*
Wk 5 26-01Sep	20	*71*	13	*46*	21	*75*	15	*53*	21	*75*	13	*46*	45	*160*

SEPTEMBER 2002

2002	**MON**		**TUE**		**WED**		**THU**		**FRI**		**SAT**		**SUN**	
	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*
Wk 1 02-08Sep	17	*61*	18	*64*	27	*96*	11	*39*	20	*71*	22	*78*	53	*189*
Wk 2 09-15Sep	16	*57*	16	*57*	20	*71*	16	*57*	18	*64*	42	*150*	55	*196*
Wk 3 16-22Sep	18	*64*	17	*61*	19	*68*	18	*64*	17	*61*	35	*125*	54	*192*
***Wk 4 23-29Sep**	16	*57*	41	*146*	37	*132*	32	*114*	22	*78*	41	*146*	73	*260*

OCTOBER 2002 Data highlighted in green is the daily average for the whole data set.

2002	MON		TUE		WED		THU		FRI		SAT		SUN	
	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*	Vehicles	*People*
***Wk 1 30-06Oct**	21	*75*	32	*114*	35	*125*	29	*103*	27	*96*	36	*128*	44	*157*
Wk 2 07-13Oct	14	*61*	27	*96*	25	*89*	14	*50*	20	*71*	38	*135*	78	*279*
AVERAGES	29	102	27	95	27	98	26	94	26	93	46	164	78	279

Note: * These dates indicate school holidays;
People estimates are based on vehicle numbers x 3.56, the average number of people in vehicles established from questionnaire, item # 8.
Data highlighted in yellow or in green were not included in the overall daily averages.

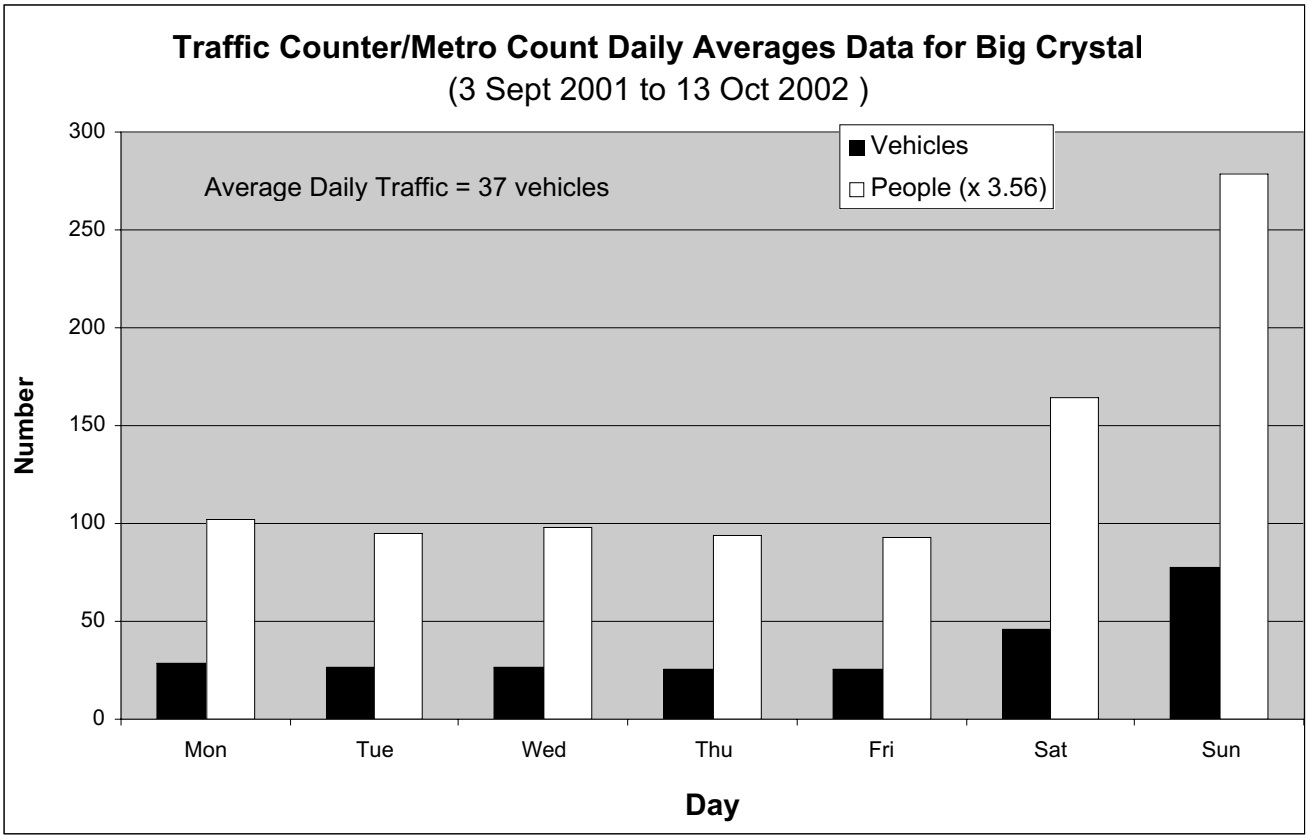


Figure 9: Average daily vehicle and visitor numbers for Big Crystal.

Comparative Traffic Counter Data : *Big Crystal*

(Source: Manidis Roberts 1993/1994 study, and WTMA Traffic Counter Records (1994-1997)

Figure 10: Monthly visitor estimates established since 1994

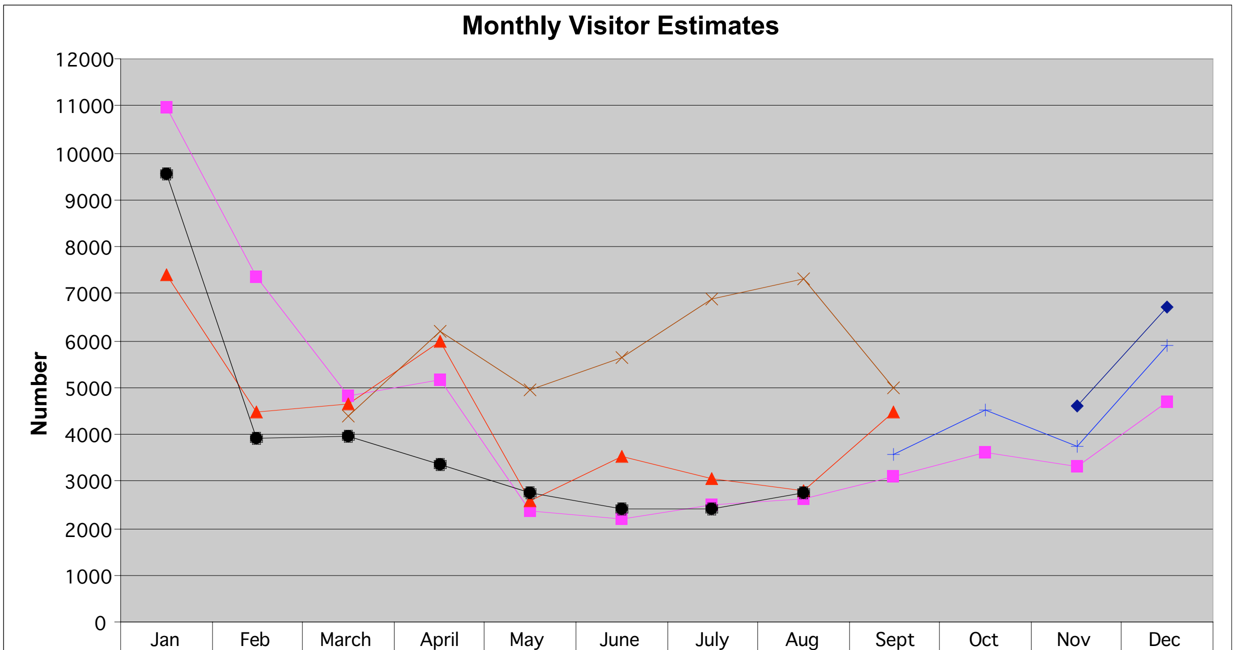
a. Visitor estimates for the period 1994-1998 have been based on 3.5 people per vehicle as established by the Manidis Roberts 1993/94 study;

b. Visitor estimates for 2001-2002 period have been based on 3.54 people per vehicle as established by this study;

c. Visitor estimates were highest in the mid year months in 1996;

d. Visitor estimates for this study period, 2001-2002, show a similar monthly pattern as 1994;

e. Consistently, the monthly figures were highest in January across all years.



	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1993											4599	6697
1994	10989	7345	4796	5148	2346	2186	2485	2643	3097	3618	3302	4698
1995	7389	4469	4641	5962	2582	3542	3069	2812	4475			
1996			4399	6187	4965	5639	6887	7308	4987			
1997												
1998												
2001									3553	4532	3745	5913
2002	9530	3930	3968	3343	2737	2421	2426	2761				

Figure 10: Monthly visitor estimates for Big Crystal established from WTMA traffic counter data 1994 – 1997, and this study, 2001-2002. Data was unavailable for the period 1997 and 1998.

SECTION FOUR

Section Four

Management Considerations

- Presentation
- Opportunities
- Specific Problems & Issues

Presentation

- **Significance** ***WHA Status, Natural & Cultural Attributes, Historical Context***
- **Management Agency** ***Identity and Presence, Conservation and Protection***
- **Information** ***Sources and Signage***
- **Structural Features** ***Layout and Design, Infrastructure and Facilities***

The Wet Tropics Management Authority (WTMA) was established to manage the area to meet Government commitments under the World Heritage Convention which are specifically to protect, conserve, ***present****, transmit to future generations, and rehabilitate the Wet Tropics WHA*

(WTMA, 2000, pg.4).

Presentation in the context of a World Heritage property and with respect to WTWHA visitor sites encompasses the significance and meaning of World Heritage status, the nature of the natural and cultural attributes as 'heritage values' for which an area has been listed, and the historical context of the site, including its natural history and history of human use, association and meaning. Presentation also encompasses a number of other management responsibilities, including maintenance, communication, site design, amenity provision, and identification of those authorities and agencies responsible for the management of the site. While many of these considerations are often subsumed under the term 'interpretation', the term presentation is used here along with subheadings to more directly address the specific mandate and multiple responsibilities of a World Heritage management authority.

Significance: *WHA Status, Natural and Cultural Attributes*

WHA Status The presentation of Big Crystal as a Wet Tropics World Heritage Area site (WTWHA) is problematic. It is of concern that approximately 86 percent of respondents were not aware that the area had any special significance, and only 15 percent of respondents appeared to be aware that this site was a part of the WTWHA (Section 1 Visitor Survey pg 34-35). This is especially noteworthy in that 93.3 percent of visitors surveyed were Australian, and 88.3 percent of these Australian visitors were local residents (Section 1 Visitor Survey pg 20-21), who would be expected to be knowledgeable about the status of this area. Unlike some other sites in the WTWHA, there is no distinct signage present at Big Crystal that indicates that the site is part of the WTWHA. This may have accounted for the low awareness of the WHA status of the site.

Natural and Cultural Attributes A principal aspect of presentation of a WTWHA site is natural and cultural heritage interpretation. There is no indigenous cultural information presented at Big Crystal (Section 2 Sign and Infrastructure Inventory pgs 47-51). This is despite the traditional occupation of the area by the Wulguru-Kaba people. Additionally, the area is rich in non-indigenous history, particularly in regards to the tin mining that once occurred at the site and surrounding areas. Such historical and cultural information was requested by some visitors at Big Crystal (Section 1 Visitor Survey pg 39), and its inclusion at the site may provide visitors with a greater appreciation of the environment, and the history of the human connection to the area. The Big Crystal site also lacks specific natural/ecological interpretive information. This is particularly noteworthy as Big Crystal differs significantly in terms of its natural environment to other sites in the WTWHA. Acknowledging this differentiation between the sites, in particular in terms of rainfall, type of vegetation, soils, and fauna could provide a basis for such information.

Management Agency: *Identity and Presence, Conservation and Protection*

Identity & Presence A related presentation issue is level of visitor and other user awareness of the management agency responsible for the management of the site. Up to 60 percent of visitors did not know who the management agency responsible for Big Crystal was (Section 1 Visitor Survey pg 34-35). This is noteworthy given that this site attracts repeat visits from both local and domestic Australian visitors (Section 1 pg 22-23), and has signage that specifically identifies QPWS as the management agency in the camping area and along the access road (Section 2 Site Inventory pgs 47-51). This lack of awareness and/or confusion amongst visitors has clear implications for the non reporting of critical incidents or damage, the provision of any type of feedback to managers, the public representation of agencies, and management performance monitoring.

Conservation & Protection Visitors to Big Crystal have rated the natural and infrastructure aspects of the site low to moderate (Section 1 Visitor Survey pgs 26-27; 32-33). Interestingly, visitors in the wet season rated the natural and built environments of Big Crystal higher than visitors in the dry season (Section 1 Visitor Survey pgs 26-27; 32-33). This is also reflected in visitor comments about what aspects improved or enhanced visitor enjoyment of the site. Visitors in the wet season more frequently cited the natural aspects and facilities compared to visitors in the dry season (Section 1 Visitor Survey pg 39). Overall, approximately one third of visitors agreed to some extent that the site appeared to be disturbed and impacted. Furthermore, approximately 60 percent of visitors agreed to some extent that they were concerned about the impacts of human activity on the natural environment at Big Crystal. These findings reveal some level of concern by visitors, who are mostly local, for the environment at Big Crystal. This is not surprising given the history of use at Big Crystal, where vandalism and destruction of the site has forced management to put in place time controlled camping restrictions at the site.

Information *Sources and Signage*

Sources Presentation of the WTWHA and the decision to visit sites such as Big Crystal is closely linked to and influenced by the way in which relevant information is accessed or sourced. Clearly the high local use of this site and the many repeat visitors would explain the lack of use of information sources such as information centres or web sites, and alternatively the high dependence on prior knowledge and/or word of mouth of this user group for information about Big Crystal (Section 1 Visitor Survey, pg 22-23). Given this, a carefully considered site-based information dissemination program needs to be adopted to insure that this important and substantial user group of the WTWHA has access to all relevant and critical information.

Signage Another important presentation issue and management responsibility at sites such as Big Crystal is the provision of signage that clearly identifies rules and regulations, safety issues, and directions. Here at Big Crystal such signage is evident throughout (Section 2 Sign Inventory pgs 48-51). In addition, visitor appraisal of various aspects of such signage was moderately high (Section 1 Visitor Survey pgs 30-31), and their overall condition appeared to be good (Section 2 Sign Inventory pgs 48-51).

Structural Features *Layout and Design, Infrastructure and Facilities*

Layout and Design The current site layout and design at Big Crystal appears to be functional (Section 2 Site Inventory pg 56-57). The site is large enough and the layout of the picnic and camping areas is such that it appears to mitigate potential use conflicts and distribute visitors over the site in a way which maximises choice and options.

Infrastructure and Facilities While the infrastructure and facilities at Big Crystal provide for most of the visitor needs, visitor appraisal of the adequacy, appeal, condition and management of the built environment was low (Section 1 Visitor Survey pgs 32-33). Most of the facilities present are well used (Section 1 Visitor Survey pgs 32-33). The most requested facility at Big Crystal was for rubbish bins, followed by more barbecues and fire places, particularly in the camping section (Section 1 Visitor Survey pg 33).

Opportunities

- **Recreational** **Activity-based Opportunities**
- **Experiential** **Experience-based Opportunities**
- **Educational** **Knowledge-based Opportunities**

Opportunities in the context of protected area visitor sites have traditionally been seen to encompass a spectrum of activity-based recreation outcomes within which experience-based opportunities have been embedded. Knowledge-based considerations have on the whole been absent. Here in this discussion this concept has been broadened to profile and highlight the importance of experience-based and knowledge-based opportunities in addition to activity-based opportunities at sites such as Big Crystal as separate but interlinked entities. The term opportunities along with the subheadings thus allow for a more direct linking of management considerations to specific needs of visitors in terms of opportunities sought, available and utilised.

Recreational *Activity-based*

Activity-based The activity-based recreational opportunities available at Big Crystal are largely those of a 'National Park' day use and overnight camping site, and include swimming, picnicing, a short walking track, and open grassed areas for other activities (Section 2 Infrastructure Inventory pg 46). The activities reported by respondents (Section 1 Visitor Survey pgs 28-29) indicate that the site was providing for and facilitating those activities which most visitors were seeking in a reasonable way.

Experiential *Experience-based*

Experience-based Experience-based opportunities at Big Crystal include nature watching, relaxation, as well as the opportunity of encountering, experiencing, and appreciating the WTWHA. Such opportunities were identified by visitors as being the most important in terms of their reasons for visiting this site (Section 1 Visitor Survey pg 24-25), and were significantly more important than activity-based reasons. Experiences such as solitude, 'wilderness' experience, and wildlife encounters are somewhat difficult to achieve at Big Crystal given its layout, extent, general character, and history and pattern of use, the site nevertheless appears to accommodate for current visitor needs. Other important experience-based opportunities that continue to attract visitors to this site and reflect the strong local use association are place connection, meaning, and identification.

Educational *Knowledge-based Opportunities*

Knowledge-based Knowledge-based opportunities at Big Crystal are very limited. As already discussed, there is no cultural/historical information available, and very little natural/ecological information. Visitor requests for such information is evident (Section 1 Visitor Survey pg 39). By providing this information visitor appraisal and appreciation of the site may increase.

Specific Problems and Issues

- **Problems** ***Risk Activity and Regulation Violation***
- **Issues** ***Use/User Conflicts, Inappropriate Behaviour, Crowding and Overuse***

There are a number of problems and issues associated with Big Crystal. As will be discussed, such problems and issues can have a detrimental impact on the natural environment as well as the psychosocial environment. Some of the specific problems and issues could be related to the history of use of Big Crystal, and the profile of its visitors.

Problems *Risk Activity*

Risk Activity Risk activity was associated with speeding along the access road and in the car park (Section 1 Visitor Survey pgs 29; 42 & 44).

Issues *Use/User Conflicts, Inappropriate Behaviour, Crowding and Overuse*

Use/user conflict Although, use/user conflict appears to be at a minimum at Big Crystal, there is still evidence to suggest that some visitors to Big Crystal are experiencing some user conflict (Section 1 Visitor Survey pg 36-37). This conflict appears to be more likely due to the behaviour of other visitors than the layout and design of the site. For example, approximately 20 percent of visitors to Big Crystal in Stage 1 agreed to some extent that the presence of other people prevented them from doing what they wanted to do. In light of visitor comments made on the survey and observations by field staff (Section 1 Visitor Survey pgs 39 & 42), this evidence suggests that user conflict is the result of behaviours from other visitors.

Inappropriate Behaviour Inappropriate behaviour at Big Crystal has a detrimental effect to both the natural and psychosocial environments. Observations made by field staff (Section 1 Behavioural Observations pg 42), and the visitor comments (Section 1 Visitor Survey pg 39), identified a range of behaviours including stripping bark from trees, feeding wildlife and littering. Disturbance from speeding on the access road and loud music was also a concern.

Crowding and Overuse Just over one quarter of visitors to Big Crystal identified crowding as a concern (Section 1 Visitor Survey pg 37). This is an interesting response given that Big Crystal receives relatively low numbers of visitors (Section 3 Vehicle and Visitor Monitoring), and the extensiveness of the layout of the setting. This concern about crowding may be exaggerated by inappropriate behaviour together with number of people.

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WTWHA Reports 2001/2002

The reports produced by the Rainforest CRC Project 4.1 research team for the 2001 and 2002 Wet Tropics World Heritage Area site surveys and the Wet Tropics World Heritage Area community survey are listed below.

WTWHA Site Level Data Reports:

Bentrupperbäumer, J. M. (2002a) *Murray Falls: Site Level Data Report 2001/2002*. Rainforest Cooperative Research Centre: Cairns.

Bentrupperbäumer, J. M. (2002b) *Davies Creek: Site Level Data Report 2001/2002*. Rainforest Cooperative Research Centre: Cairns.

Bentrupperbäumer, J. M. (2002c) *Barron Falls: Site Level Data Report 2001/2002*. Rainforest Cooperative Research Centre: Cairns.

Bentrupperbäumer, J. M. (2002d) *The Crater: Site Level Data Report 2001/2002*. Rainforest Cooperative Research Centre: Cairns.

Bentrupperbäumer, J. M. (2002e) *Lake Barrine: Site Level Data Report 2001/2002*. Rainforest Cooperative Research Centre: Cairns.

Bentrupperbäumer, J. M. (2002f) *Marrdja: Site Level Data Report 2001/2002*. Rainforest Cooperative Research Centre: Cairns.

Bentrupperbäumer, J. M. (2002g) *Big Crystal: Site Level Data Report 2001/2002*. Rainforest Cooperative Research Centre: Cairns.

Bentrupperbäumer, J. M. (2002h) *Goldsborough: Site Level Data Report 2001/2002*. Rainforest Cooperative Research Centre: Cairns.

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- Attachment: *Research Procedural Manual*: *Measuring and Monitoring the Impacts of Visitation and Use in the Wet Tropics World Heritage Area*. Rainforest Cooperative Research Centre: Cairns.

WTWHA Community Survey Reports:

Bentrupperbäumer, J. M. & Reser, J.P. (2002b) *The Role of the Wet Tropics in the Life of the Community: A Wet Tropics World Heritage Area Community Survey 2001/2002*. Rainforest Cooperative Research Centre: Cairns.
- Attachment: *Research Procedural Manual*: *Wet Tropics World Heritage Area Community Survey 2001/2002*. Rainforest Cooperative Research Centre: Cairns.