

## Issues and Indicators of Acceptable Change:

**A study of visitors' and stakeholders' concerns about three natural attractions in the Paparoa area, West Coast, South Island, New Zealand.**

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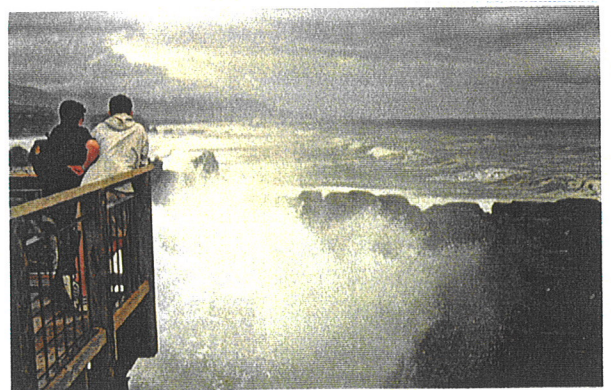
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**Pancake Rocks 1934**



**Pancake Rocks 2000**







## PREFACE

This report is one of a series of products from a tendered research programme funded by the Foundation for Research, Science and Technology. The programme is titled “Indicators of acceptable environmental change caused by tourism for environmental systems on which tourism depends”.

The objectives of this programme are to:

- Classify natural assets visited by tourists, catalogue the effects of different tourist activities on the assets, identify indicators of change and specify their limits of acceptable change as defined by biological experts and an advisory panel.
- Characterise tourist flows and Recreation Opportunity Spectrum - based tourist segment composition at a regional level to produce a flow data management system that provides disaggregated flow data in response to user queries.
- Document environmental impacts at a regional scale by linking tourist flow patterns to activity and impact indicators, relative to the spatial distribution of natural assets.
- Develop guidelines and checklists for achieving better management of nature-based tourism and improved proposals for new developments.

The West Coast of the South Island has been used for field studies at the regional level but the guidelines and checklists will be applicable at the national level.



# Chapter 1

## Executive Summary

This report presents results from visitor surveys and stakeholder interviews at three natural attractions in the Paparoa National Park. The sites were the Pancake Rocks/ Dolomite Point, the Fox River Caves, and the Westland Black Petrel colony. Questions in the surveys and interviews were based on the Limits of Acceptable Change (LAC) framework to identify potential indicators of change at the site, and were developed from previous studies using this system.

The surveys gathered information on visitors' experience of the Pancake Rocks and Fox River caves, and people's sensitivity to impacts encountered at the sites. This was done using self-administered questionnaires on-site immediately after the visit. Stakeholders were interviewed about their issues and concerns for all three sites, and were asked to provide a list of potential indicators of acceptable change.

Overall visitors to the Pancake Rocks were very satisfied with the site, and were happy with the level of maintenance and development. All of the Pancake Rocks indicators of change received acceptable ratings on average, and no further indicators were derived from the open-ended questions. The Pancake Rocks are a good example of a high-use natural attraction that gives rise to positive visitor experiences. However, stakeholders had a number of concerns about the site, which included the adjacent commercial area. These concerns were predominantly about the management of the site, the flow of people around the tracks, the provision of and responsibility for amenities, as well as safety issues.

The Fox River Caves visitors also had positive experiences at the site, but there were far fewer people on average than at the Pancake Rocks. The responses in the Caves survey indicated there are two indicators of change that may be currently rated as unacceptable by visitors in a LAC framework: information and interpretation, and the amount of visible visitor impact. The stakeholders were also very concerned about visitor impacts (both intentional and unintentional), especially damage to formations in the caves. Several interviewees also mentioned safety issues and problems with estimating visitor numbers.

The Westland Black Petrel Colony breeds in winter on the West Coast. As winter is a quiet time of year for tourists, and the field work for this project was limited to a few weeks in the high summer season, visitor surveys were not conducted for this site. However, stakeholders were interviewed to gain an insight into the issues and concerns about the colony. The predominant concern from all stakeholder groups was about direct impacts on the birds from predators, disruption to their flight path, and farm animals. Many of the respondents were also worried about the long-term protection of the species.

Stakeholders varied in their knowledge of appropriate and measurable indicators of change at all three sites, however an extensive list was developed that now needs to be reviewed by a panel of experts. This will be completed in another component of this research project by Lincoln University. The issues and concerns presented here allows for the sites to be placed in a social context by the readers.



## Chapter 2

### Introduction

#### 2.1 Project Aims

The purpose of this report is to provide the Lincoln University research programme entitled “Indicators of Acceptable Environmental Change” with information about the issues and concerns surrounding three natural attractions in the Punakaiki area on the West Coast of the South Island. The programme also requires a list of key environmental indicators for each site to be identified by stakeholder groups and visitors to the sites.

More specifically, the project aim was to:

- document stakeholders’ issues and concerns about each site;
- collect visitor experience information ;
- evaluate visitors’ sensitivity to potential impacts on-site;
- develop a list of potential indicators of change at each site, as stated by stakeholders and visitors.

#### 2.2 The Limits of Acceptable Change Framework

The research programme is based in a Limits of Acceptable Change framework, which is an ongoing planning system for managers of natural environments (Stankey et al., 1985). Derived from the Carrying Capacity concept, the Limits of Acceptable Change process has evolved to a system that identifies the change in conditions resulting from use of an area, the desired state of these conditions (limits of acceptable change), and the management techniques necessary for keeping the area within these limits. The continual monitoring of impacts in the LAC system means that the acceptable impact limits may vary over time, if management decides this is necessary.

Since its inception, the LAC system has been applied to many different types of environments across the world, most of which have been land-based. Examples of the use of LAC in terrestrial environments can be found in areas such as the Barva Site of Braulio Carrillo National Park in Costa Rica<sup>1</sup>, the Gulkana River system in Alaska<sup>2</sup>, and forest wilderness areas within the Sierra, Inyo, and Sequoia National Forests in the USA<sup>3</sup>.

This study is the first stage of the LAC implementation process, which gathers information on the issues and concerns held by managers, stakeholders and users alike. In addition to this, information was also required on indicators of change that stakeholders thought were useful and measurable. A range of indicators were also tested on visitors to the area.

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<sup>1</sup> See the web site <http://www.hotel-online.com/Neo/Trends/PanAmerProceedingsMay99/BarvaSite> for further details.

<sup>2</sup> See the web site <http://www.glenallen.ak.blm.gov/gulkana2> for further details.

<sup>3</sup> See the web site <http://www.395.com/deis/summary> for further details.

## **2.3 Description of Study Sites**

Punakaiki is situated on State Highway 6, which runs down the West Coast of the South Island and is used as the main route north of Greymouth. The small township of Punakaiki has a range of accommodation for visitors to the area, from backpackers and campgrounds, to motels and well-appointed bed and breakfasts. There is a café, a craft shop with an adjoining coffee shop, a visitor information centre (operated by the Department of Conservation (DoC)), a tavern, and several businesses that offer tours and activities for visitors. Three study sites, representative of a broad range of natural attractions in New Zealand and on the West Coast, were selected.

### **2.3.1 Pancake Rocks (Dolomite Point)**

The Pancake Rocks are an interesting geological attraction that currently receives approximately 500,000 visitors per annum (estimates range from 400,000 to 600,000, according to local businesses and DoC figures). Many of these are 'short stop' visitors who do not stay at Punakaiki. A track takes visitors out to the lookouts where they can view the layered 'pancake' effect in the limestone, and blowholes that have been carved out of the rocks by the force of the sea. Interpretation panels have been installed to explain the geological formations and provide some information on the tangata whenua associations with the site. Visitors can easily walk from the entrance to the main lookout within 10 minutes, stopping along the way at several other lookout points. There was a major upgrade of the track and viewing platforms approximately eight months prior to the fieldwork.

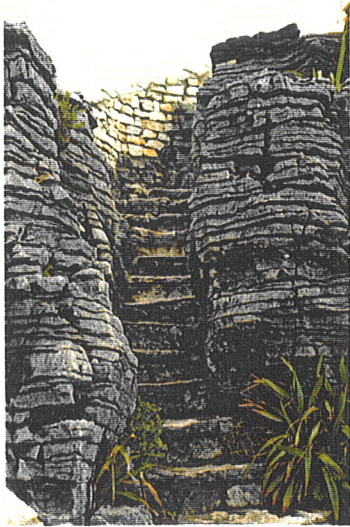
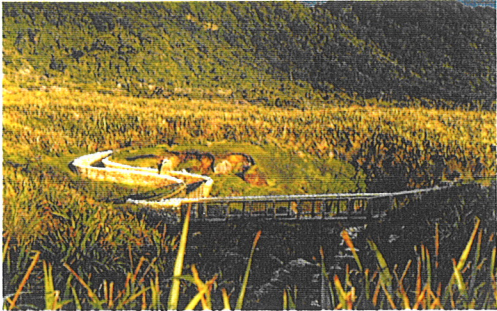
### **2.3.2 Fox River Caves**

Designated by DoC as a 'tourist cave', the main Fox River Cave provides visitors with a self-guided caving experience (although some tour groups visit the cave with their tour guide). A visit to the cave can be done in half a day. The walk to the caves takes a little more than one hour from the car park on State Highway 6, which is approximately twelve kilometres north of Punakaiki. The track includes a river crossing, however the water level varies from virtually no water to flooding levels, and can change quite dramatically in a short period of time if the back country areas have received a lot of rain. There is approximately 100-150 m of track in the cave that visitors equipped with only a torch can explore. Throughout this section of the cave system there are many formations such as stalactites and stalagmites. Other areas of the Fox River Caves system are dangerous for casual visitors, and signs mark these hazards. A second entrance to the system is situated next to the main tourist entrance, however this is a vertical shaft and requires caving equipment and experience to enter. A warning sign is located near the entrance. The narrowing end of the trail in the main cave is marked by red tape, which is also used to keep people out of an area that is more sensitive to visitor impact.

### **2.3.3 Westland Black Petrel Colony**

The Westland black petrels (*Procellaria westlandica*) breed in an area just a few kilometres south of the Punakaiki River. Two areas of the colony will be discussed in this report. Most birds nest in burrows on conservation land that has been set aside for preservation of the species. Access is not allowed onto this land without a permit from the Department of Conservation. Visitors to the area can view these birds in a sub colony occupying private land adjacent to the conservation reserve. A viewing operation has been established by a local operator, which allows visitors to walk through the colony site and experience the birds

at close range without disturbing their burrows. The operator has built structures such as walkways and bird hides to minimise impacts on the birds. The birds only breed in the winter months, which is the low tourist season, so this attraction does not feature strongly as a Punakaiki tourism drawcard.



**Figure 1. Photographs of the track at Pancake Rocks**





## Chapter 3

### Methodology

#### 3.1 Development of the Survey Instruments

The stakeholder interviews were structured (see below for methodology) and further comments were explored in the interview to clarify the issues being discussed. Due to the time constraints on this project, it was impossible to conduct a similar style of interviews with the visitors to the area. Instead, a self-administered questionnaire was used in which open-ended questions asked respondents about their experience immediately after their visit. Respondents were also asked to rate the site according to a list of potential social, biological and physical conditions or impacts. These conditions were drawn from literature on indicators for similar environments (Whittaker, 1992; Watson & Cole, 1993), and discussions with the project team. It was important to develop a list of indicators that are relevant and measurable for the site. The *Table of SEM Achievements to January 1998* by the Jenolan Cave's Social and Environmental Monitoring Committee (1998) in Australia was particularly useful in developing indicators for the Fox River Caves. Since Jenolan Caves are "show caves" with lighting, built structures and much higher visitor numbers, some of the indicators outlined in the report were not appropriate for the situation at the Fox River Caves and were left out of the visitor survey.

While the sites in this study are actively managed and maintained, the list of conditions and impacts to be rated by visitors included indicators which might currently be used by managers as well as other potential indicators drawn from the literature and team discussions. This was done to test many possible indicators, and in combination with the open-ended questions, would give a more accurate picture of visitors' experiences.

#### 3.2 Survey Instrument

Visitors to the Pancake Rocks and Fox River Caves were surveyed using a self-administered questionnaire that was based in part on a survey design developed by Shafer et al (1998) for a similar visitor survey within a LAC framework. The surveys were available in English or German versions.

#### 3.3 Pancake Rock Visitor Surveys

Two survey periods were chosen to reflect the difference in travel patterns by domestic and international visitors. The first sampling period was from mid February to early March 2000, at the end of the high tourist season during which there were many international visitors on the West Coast. The second sample was undertaken during the Easter school holidays, while many New Zealand families were travelling on the West Coast.

For each week of field work, a timetable for sampling was drawn up for the hours between 8.30 am and 8.30 pm. One hour sampling periods were chosen and spread throughout each week so that no period was sampled more than once. This method also allowed the

researcher to conduct local stakeholder interviews in between survey sessions. During each one hour period, every sixth person from the track was asked to participate in the survey. This was done to reflect the relative number of people on the site at that time of day. Busier periods meant that more surveys were completed, while quieter periods very few surveys were completed. The spread of survey numbers in this way reduces over-sampling at times of the day when there are not many people on the site, and some issues addressed in the survey (such as crowding) are not likely to be a concern at that time.

Once the visitor agreed to participate, they were handed a survey, pen and clipboard and asked to fill in the questionnaire while the researcher continued to count the number of people leaving the track. Upon completion of the survey, respondents were thanked and for their participation were given a high quality postcard depicting West Coast scenery.

Extremely busy periods were sometimes difficult to manage as there were too many people going through the site, making it impossible to approach every sixth person. This happened three times during the sampling in February, and it was estimated that the sample size was approximately 12 people less than it should have been. While refusal rates were fairly low (51 people refused out of 380 people approached), two days received an unusually high refusal rate. The average refusal rate was two per day, with two other days receiving 12 refusals. These came mainly from several German tour groups that had limited time at the site, and had difficulties understanding English when they were approached by the researcher. German free independent travellers usually understood enough English to understand the request from the researcher and agreed to participate in the study, however many of them opted for the German version of the survey.

The Pancake Rocks Visitor Survey is presented in Appendix 1.

### **3.4 Cave Visitor Surveys**

Due to the low number of visitors the Fox River Caves site receives, it was impossible to follow a similar sampling strategy to the Pancake Rocks survey. Instead, people were approached around the Punakaiki township and at the Fox River Caves car park and asked if they had visited the caves. If they had been to the caves, they were then asked if they would participate in the survey. As in the Pancake Rocks survey, respondents were asked to fill in the questionnaire and were handed a postcard upon completion. Twenty four of the 26 respondents were surveyed at the car park for Fox river Caves.

During the February sampling period, a group of people on a guided tour of the West Coast visited the caves. They agreed to participate in the survey, resulting in nine completed questionnaires from this group. None of the cave visitors refused to participate in the survey.

A copy of the West Coast Caves visitor survey can be found in Appendix 2.

### **3.5 Stakeholder Interviews**

Stakeholders were identified from the following groups to discuss issues and concerns about the three natural attractions at Punakaiki. The number of respondents is given in brackets (some respondents could be placed into two categories, in which case they were asked to give their opinions from both perspectives).

- Department of Conservation (8)
- Tourism operators (6)
- Local businesses (5)
- Other Punakaiki local residents and bach owner (3)
- Tangata whenua (3)
- Buller District Council (1)
- West Coast Regional Council (1)
- 'Expert' cave users (1)
- West Coast Conservation Board (2)

Biological experts are being consulted in a separate stage of the overall project, by other researchers in the project team.

Key people from all stakeholder groups were identified and contacted to arrange an interview. Each person was asked similar questions during the structured interview, and most discussions were recorded on a cassette tape for transcribing at a later date. A few stakeholders were unable to meet for an interview so the questions were sent to them via email or post.

Feedback from tangata whenua was not received in time for this report, however it is likely that some information will be available to be fed into the project later. Therefore, the reader must be aware that there are likely to be several other issues at these sites that are not listed in this report.

As all interviewees were assured of confidentiality, the results shown here will not identify individual respondents however, where it is appropriate, the stakeholder group they represent will be mentioned. The reader must bear in mind that it is the nature of the issues and concerns that are the focus of this report, rather than which person made the comments.

Twenty-two interviews were conducted, mainly in February and March 2000. A list of the questions asked is presented in Appendix 3



## Chapter 4

### Results - Pancake Rocks Visitor Survey

#### 4.1 Visitor Profile

A total of 329 visitors to the Pancake Rocks were surveyed. Below is a summary of the responses to some general visitor profile questions. Appendix 4 contains tables of the results to these questions.

##### 4.1.1 Who Were They?

One third of the sample was domestic travellers, and around half of these people were from the North Island. Of the international visitors, the majority were from the UK, Germany, Australia and the United States. Most people were travelling with their partner/spouse or family. The sampling technique resulted in almost the same number of male and female respondents. Half of the respondents were between the ages of 15 and 39 years of age, with almost a third of the sample falling between the ages of 25 to 34 years.

##### 4.1.2 Transport

Two-thirds of the sample said they were travelling by car or van. These vehicles were either privately owned or rented. Nearly 12% travelled by campervan, and a similar number said they were on a bus (such as Kiwi Experience, Magic Bus, Intercity, etc).

##### 4.1.3 Previous Experience of the Pancake Rocks

One quarter of the respondents had visited the Pancake Rocks before the day of the survey. About half of these people indicated that they visit the site only occasionally in their lifetime, and one third said they visit once every few years.

#### 4.2 Visitor Experience of the Site

##### 4.2.1 Things that added to visitors enjoyment of Pancake Rocks

Respondents were asked in an open-ended question to list the things that stood out as adding to their enjoyment of the site. Of the 215 respondents who made comments in this section, most spoke of the human-made physical environment and the natural physical environment. A total of 320 comments were collected, for which the main themes and sub-themes of all the visitors' comments are explained below. Note that the first two themes have reasonably large response rates (48% and 38%), while the rest of the themes, and all of the themes for "things that detracted from the experience", had response rates of 5% or below.

##### **Theme 1: Human-made physical environment**

**Number of responses: 158**

**Percent of total visitors: 48%**

*Sub-theme: Track*      *Number of responses: 59 (18% of visitors)*

The most frequent comments recorded in Theme 1 were those specifically about the track at the site. Overall, these people were happy with the condition of the track and the ease of walking around the site. The layout and look of the paths also pleased most of these people.

*Sub-theme: Signs and Information*      *Number of responses: 26 (8%)*

The next most frequently mentioned sub-theme was the signs and information at the site. These 26 people thought that there was a good amount of information, that it was interesting, and they liked the explanations of the geological features they were viewing at the time.

*Sub-theme: Access*      *Number of responses: 22 (7%)*

Twenty-two people made comments specifically about access to the site. They thought it was safe and easy, and a few people mentioned that wheelchair access was a positive feature of the site.

*Sub-theme: Design*      *Number of responses: 19 (6%)*

Comments in this sub-theme indicate that the respondents admired the design of the site, and many thought that it was done in harmony with the natural setting.

*Sub-theme: Viewing platforms*      *Number of responses: 13 (4%)*

Thirteen visitors said that the viewing platforms added to their enjoyment of the site. They thought the platforms were well positioned and well designed.

*Sub-theme: Maintenance*      *Number of responses: 9 (3%)*

Nine people made general comments relating the maintenance of the site. These comments were mainly about the clean, tidy state of the site.

*Sub-theme: Other*      *Number of responses: 10 (3%)*

Ten other comments were made in this theme; they were about the walk into the site in general (e.g. “*the nice walk*”), the good coffee at the café, the overall impression of the site, and safety.

## **Theme 2: Natural physical environment**

**Number of responses: 124**

**Percent of total visitors: 38%**

*Sub-theme: Blowholes*      *Number of responses: 26 (8%)*

Around one fifth of the Theme 2 comments were specifically about the blowholes. These visitors enjoyed seeing the blowholes “*working*”.

*Sub-theme: Scenery*      *Number of responses: 23 (7%)*

The comments that fell into this category were words describing the scenery in general such as “*great views*”, “*beauty*”, and “*sea views*”.

*Sub-theme: Rocks*      *Number of responses: 20 (6%)*

Visitors’ comments in this category reflected the scenic value of the unique rock formations at the site. People said they enjoyed “*the different shapes of the stones*”, “*the beautiful rocks*”, and “*the peculiarity of the rock formations*”.

*Sub-theme: Weather*      *Number of responses: 19 (6%)*

Not surprisingly, most of the comments made about the weather were on fine days. However, a few people also enjoyed less favourable conditions, describing the weather as “*bad*” or “*wild*”.

*Sub-theme: Ocean and waves*      *Number of responses: 18 (5%)*

These people said that seeing the ocean or the waves added to their experience. Some of the comments were “*the power of the sea*”, “*roaring/booming of the sea*”, and “*crashing surf below the rocks*”.

*Sub-theme: General nature*      *Number of responses: 18 (5%)*

“*The natural environment*”, “*natural beauty*”, and “*nature in the raw*” are typical comments in this category.

### **Theme 3: Biological**

**Number of responses: 16**      **Percent of total visitors: 5%**

Most of the biological related comments were about the vegetation in the area (the native vegetation featured prominently).

### **Theme 4: Social**

**Number of responses: 11**      **Percent of total visitors: 3%**

Very few comments were made about the social environment at the site. Of those who did, most said they enjoyed the company of their travel group.

### **Theme 5: Other**

**Number of responses: 11**      **Percent of total visitors: 3%**

These comments were typically too vague to place in the categories above, for example, “*the general impression of the area*” and “*I’ve never seen anything like Pancake Rocks*”.

## **4.2.2 Things That Detracted From Visitor’s Enjoyment of Pancake Rocks**

About 12% (39 people) of respondents listed things that detracted from their enjoyment of the site. Using the same themes developed above, these comments can be broken down into the following categories:

### **Theme 1: Human-made physical environment**

**Number of responses: 17**      **Percent of total visitors: 5%**

Ten people said they didn’t like the track at the site; most of them thought that it did not look natural. Three comments were about the development around the Pancake Rocks – specifically the signs, shops, and track. Two respondents said the track maintenance disturbed them. The other two respondents indicated that they wanted to be able to walk on the rocks.

### **Theme 2: Natural physical environment**

**Number of responses: 12**      **Percent of total visitors: 4%**

Six of these people commented that the weather conditions, usually the rain, detracted from their enjoyment. During the fieldwork, the weather conditions were usually fine and heavy rain was present for only two sampling days. The other six respondents said they were disappointed that the tide was too low for the blowholes to be working.

**Theme 3: Social****Number of responses: 7****Percent of total visitors: 2%**

About half of these comments were about the number of people at the site, and the other half related to the behaviour of other people.

**Theme 4: Biological****Number of responses: 4****Percent of total visitors: 1%**

Sandflies affected all four responses in this category.

**Theme 5: Other****Number of responses: 2****Percent of total visitors: 0.6%**

One respondent thought the flax was too high near one of the lookouts, while the other was unhappy that he was not able to purchase fuel at Punakaiki.

**4.3 Values of Pancake Rocks for Visitors**

That respondent's value Pancake Rocks most for its geological values is hardly surprising given its unique geological structure (Table 1). What is a little surprising is that they rated conservation and ecological values higher than recreational opportunities. This result should be read with a little caution for two reasons. First, conservation and ecological values may be seen as "socially acceptable" responses to this question, and therefore receive a higher score than might otherwise be expected. The second possibility is that respondents may have misinterpreted the word "recreation", that is, some people may have thought that recreation means only sporting activities, and not what they were participating in at the site, which may also explain the lower score for this item.

**Table 1.**  
**Values of the Pancake Rocks For Visitors**

<b>Value</b>	<b>Frequency</b>	<b>Percent</b>
Geological values	221	22.4
Conservation values	157	15.9
Ecological values	133	13.5
Recreational opportunities	104	10.5
Educational opportunities	94	9.5
Historical meaning	66	6.7
Scientific values	48	4.9
Cultural values	34	3.4
Economic opportunities	5	0.5
Other	27	2.7
Missing	98	9.9

**4.4 Visitors' Ratings of Conditions at the Site**

The following list (Table ) of conditions was presented to respondents who were then asked to rate each condition according to whether it had a positive or negative influence on their



experience, or no influence at all. Respondents rated each condition on a seven point scale where:

- 1 = very negatively
- 2 = negatively
- 3 = somewhat negatively
- 4 = no influence either way
- 5 = somewhat positively
- 6 = positively
- 7 = very positively

**Table 2**  
**Visitors' Ratings of Conditions at Pancake Rocks**

Item	Mean	Std Dev	% positive	% no influence	% negative
The design of the viewing platforms	6.21	0.97	94%	4%	2%
The location of the viewing platforms	6.20	0.92	94%	4%	1%
The design of the walkway	6.09	1.21	90%	3%	7%
The 'naturalness' of the site	5.81	1.29	86%	6%	8%
The amount of litter I saw	5.79	1.52	75%	19%	6%
The amount of native plants I saw	5.75	1.06	85%	13%	2%
The amount of information provided	5.64	1.08	83%	14%	3%
The type of information provided	5.57	1.12	80%	16%	4%
The weather conditions	5.29	1.55	64%	19%	16%
The amount of vandalism/graffiti I saw	5.28	1.77	58%	28%	14%
Behaviour of other people	5.17	2.63	53%	39%	7%
Behaviour of other people	5.17	2.63	53%	39%	7%
The amount of human-made structures	4.93	1.42	57%	29%	14%
Number of people I saw on the walkway	4.73	1.27	43%	48%	10%
The amount of weeds I saw	4.71	1.29	38%	57%	6%
Number of people I saw at the viewing platforms	4.70	1.35	44%	43%	13%
The amount of wildlife I saw	4.33	1.40	38%	43%	20%

Clearly, the visitors felt mostly positive about the conditions at the site. Of the conditions listed, the design and location of the viewing platforms appear to have the most positive influence on visitor's experience, followed closely by the design of the walkway. Despite the physical structures, visitors felt that the site still had natural feel about it. As the site is well maintained, it is perhaps not surprising to see that the amount of weeds is the least influential either way on visitor's experiences. The amount of wildlife received the highest negative score, with 20% of the sample rating less than 4 on the scale. Again, this is not surprising given that there is not a lot of wildlife to be seen regularly. Wekas and seabirds appear at the site on most days, although they are not visible all of the time, and dolphins can be seen occasionally off the coast.

#### **4.5 Overall Rating of the Site – Pancake Rocks**

Respondents were given a 10-point scale and asked how they would rate their overall visit to Pancake Rocks. On the scale, (where 1 = poor, 3 = fair, 5 = good, 7 = very good and 10 = excellent), visitors rated it highly, giving it a mean score of 8.25 (standard deviation = 1.54).

#### **4.6 Summary Evaluation – Pancake Rocks**

Visitors to the Pancake Rocks are generally very happy with the site, and think it has been well developed and maintained. They value it highly for its unique geological features, and are impressed by the design of the new track and viewing platforms. There is no indication of any environmental or social impacts that are beyond acceptable limits in the minds of most visitors. However, if positive visitor experiences are one of the management goals, managers

will need to keep an eye on the flow of visitors to the site to avoid potential crowding and other negative social impacts, as well as ensuring that the high level of maintenance is continued at the site.

## Chapter 5

### Results - Cave Visitor Survey

#### 5.1 Visitor Profile

A total of 33 people completed the cave visitors' survey. Below is a summary of the responses to some general visitor profile questions. Appendix 5 contains tables of the results to these questions.

##### 5.1.1 Who Are They?

Two-thirds of the Fox River visitors were travelling on the West Coast by car (either private or hired). The tour group (representing approximately 25% of the sample) was travelling in a mini-van. The two other respondents were cycling and hitch hiking.

About one quarter of the respondents were domestic visitors, and another quarter was from the United Kingdom. A further one third of the group were from Canada, Australia and Ireland. New Zealanders in the survey came from Christchurch, Tasman, Auckland, Greymouth and Oxford. Those who were not in the tour group were travelling with their spouse/partner or friends. There were even proportions of males and females in the sample, and nearly half the sample was between 25-35 years of age.

##### 5.1.2 Previous Cave Experience

Most of the visitors (n=26) had been to a cave before, however their level of previous cave use was fairly low (24 of these visitors said they have only been to a few caves in their lifetime). None of the respondents belonged to a speleological club. Eight of the respondents had been to caves on the West Coast before this visit; some of these visits were during the same holiday, and were usually to the Punakaiki Cavern.

#### 5.2 Visitor Experience At the Fox River Caves

##### 5.2.1 Things That Added to the Visitors' Experience

Twenty of the 33 respondents commented on things that added to their enjoyment. Below are the themes of responses from the open-ended questions.

###### **Theme: Natural Physical Environment**

**Number of responses: 17**

**Percent of total visitors: 52%**

Comments in this category were generally about the formations inside the cave ("*the stalagmites and stalactites*"), or other structural details such as the length of the cave, or the entrance overhang.

###### **Theme: Social**

**Number of Responses: 5**

**Percent of total visitors: 15%**

The absence of other people added to the enjoyment of the cave for these visitors.

**Theme: Biological**

**Number of responses: 4**

**Percent of total visitors: 12%**

Two people said that seeing glow worms inside the cave added to their experience, while the other two comments were about cave wetas.

**Theme: Other**

**Number of responses: 8**

**Percent of total visitors: 24%**

Eight other responses were mentioned. Four of these were to do with their sense of exploration/discovery, while the others enjoyed the “*trip in*”, “*not banging my head*”, “*easy access*”, and “*getting out again*”.

### **5.2.2 Things That Detracted From Visitor’s Experience**

Fifteen respondents (45%) made comments on things that detracted from their experience. These can be broken down into two main themes: physical and social environments.

**Theme: Social**

**Number of responses: 12**

**Percent of total visitors: 36%**

Seven of these comments related to the visible signs of visitor impact inside the cave such as broken formations. Five people commented on the management tools (or lack of) around the cave: two wanted more information or signage, two didn’t like seeing evidence of management (the rocks laid out as a path, and the markers), and one thought the “tourist cave” sign at the car park was deceptive, however she was pleased that it was not as “*touristy*” as she expected.

**Theme: Physical**

**Number of responses: 6**

**Percent of total visitors: 18%**

Four of these respondents found the track to the caves difficult where it becomes steeper and slippery just before the cave entrance. One person said she was unhappy that she had to hold on to some of the formations to stop her from falling inside the cave. The other comment was about the poor weather conditions.

## **5.3 Values of Fox River Caves to Visitors**

The way the Fox River cave visitors ranked the values of the caves was very similar to the result for Pancake Rocks. Table 3, below, shows that visitors value the Fox River Caves most for their geological values, followed by conservation and ecological values. Again, recreational opportunities appear after the three natural environment values.

**Table 3.**  
**Values of Fox River Caves to Visitors**

<b>Value</b>	<b>Frequency</b>	<b>Percent</b>
Geological values	25	25.5
Conservation values	18	18.4
Ecological values	18	18.4
Recreational opportunities	11	11.2
Educational opportunities	8	8.2
Historical meaning	7	7.1
Scientific research	6	6.1
Cultural values	4	4.1
Other	1	1.0
Economic opportunities	0	0.0

#### **5.4 Visitors' Ratings of Conditions at the Site**

The mean scores in Table 4 below indicate that most visitors felt positive about the majority of conditions at the cave site. The highlights were the lack of litter, the noise in the cave (generally described as quiet or dripping sounds) and the lack of people present. However, two conditions stand out as negative influences on most people's experience: the amount of information/interpretation about the cave, and signs of visitor impact in the cave. From the comments gathered about these impacts, it is clear that visitors thought there was not enough information about the cave, and more specifically that it lacked maps and interpretation. There are a couple of warning signs at the cave entrance but nothing to tell them about any details of the cave (length, equipment needed, maps of the route), or cave etiquette (how to explore a cave with minimum impact). Signs of visitor impact – mainly broken formations, also disturbed visitors. This high level of awareness of impacts has positive implications for the success of visitor education programs. It appears that visitors are already concerned about their impacts, and are likely to be receptive to information on how to reduce them.

Several conditions appeared to have little or no influence on the majority of visitors. They were:

- the behaviour of other people in the cave,
- the air quality in the cave,
- the amount of weeds they saw on the track to the cave, and
- the hazards in the cave.

**Table 4.**  
**Visitors' Ratings of Conditions For Fox River Caves**

<b>Item</b>	<b>Mean</b>	<b>Std dev</b>	<b>% positive</b>	<b>% no influence</b>	<b>% negative</b>
The amount of litter I saw	5.56	1.37	65%	29%	6%
The number of people I saw in the cave	5.45	1.35	62%	34%	3%
Noise in the cave	5.13	1.38	55%	39%	6%
Number of people I saw on the track to the cave	5.07	1.23	55%	38%	7%
The amount of lighting in the cave	4.83	1.69	50%	32%	18%
Behaviour of other people in the cave	4.73	0.98	41%	59%	0%
The air quality in the cave	4.66	1.29	34%	63%	3%
The condition of the track to the cave	4.66	1.58	53%	22%	25%
The amount of water in the cave	4.43	1.17	31%	48%	21%
The amount of weeds I saw on the track to the cave	4.26	1.21	23%	57%	20%
Management practices and structures in the cave	4.19	1.28	32%	42%	26%
Hazards in the cave	4.16	0.92	22%	63%	16%
Movement of dirt/dust in the cave	4.16	1.19	27%	50%	23%
Signs of visitor impacts or damage in the cave	3.35	1.54	16%	19%	65%
The amount of interpretation/information about the cave	3.10	0.96	0%	38%	62%

### **5.5 Overall Rating of the Site – Fox River Caves**

Using the same 10 point scale as in the Pancake Rocks survey, respondents were asked to rate their visit to the site overall. The mean score for the caves was 7.06 (very good) and the standard deviation for this was 1.91.

### **5.6 Summary Evaluation – Fox River Caves**

Visitors to the Fox River caves generally felt they had a positive experience during which they were able to visit and explore an interesting and unusual environment. These experiences were usually intimate due to the low visitor numbers at the site. Visitors valued the caves highly for “natural” values (geological, conservation and ecological values) before social values (such as recreational opportunities). The formations in the caves impressed most of the people in the survey, as did the lack of litter, the lack of people (both on the track and in the cave), and the noise in the cave. Two things arose as possible indicators that may

have exceeded the acceptable limits of impacts in the minds of the visitors. The first was the lack of information or interpretation at the cave site. None of the respondents rated this item positively in the survey, and about two thirds rated it negatively, which gives a clear indication that more information is needed at the site. The second negatively rated condition was the amount of visible visitor impact in the cave. While this is not easily controllable, further damage can be reduced by providing the visitors with more information on the appropriate behaviour, or cave etiquette, to minimise impact while exploring. This could be done at the car park area and at the cave entrance. Cave visitors appeared to be seeking this sort of information as well as further interpretative information, which may mean that they are more receptive to impact minimisation education. The other conditions in the caves appear to satisfy most visitors, so at this stage there do not seem to be any other possible indicators of change that are close to or exceeding acceptable limits as perceived by visitors. Of course, biological or other physical indicators will also need to be assessed by experts.

## **5.7 Summary Evaluation – Both sites**

The rating of potential impact indicators required respondents to evaluate aspects of their visit that they may not have necessarily given much thought to. However, visitors' ratings of conditions at both Pancake Rocks and Fox River Caves appeared to match well with the open-ended comments people made. The present situation is that, according to visitors, the acceptable limits of change do not seem to be exceeded at Pancake Rocks. Fox River caves have two indicators that may have been exceeded – signs of visitor impact and the amount of information available. Management practices can be altered to reduce the number of negative responses to these conditions by improving the amount and type of on-site information provided. This should eventually reduce the incidence of further damage, especially that which is visible to visitors. However, some damage will always be visible. The current damage to formations is difficult (if not impossible) to repair and may take many lifetimes to re-grow, if it does at all. Educational programs can highlight this damage to demonstrate impacts, thereby raising awareness of how it is caused and what this damage means to the health of the cave environment.





## Chapter 6

### Stakeholder Interviews – Issues, Concerns and Values of the Sites

Table 5, below, lists the types of comments made by stakeholders when they were asked what they thought were the main issues and concerns at each site. The stars (\*) indicate that the issue was mentioned at least once by one of the stakeholders. Following the table are further details on the types of comments that were made in each category.

**Table 5.**  
**Stakeholders' Issues and Concerns**

Issues and Concerns	Pancake Rocks	Fox River Caves	Petrel Colony
<b>Environmental</b>			
Intentional visitor impact	*	*	
Unintentional visitor impact		*	
Flora impacts	*	*	
Fauna impacts	*	*	*
Natural processes	*		
Site/species protection	*	*	*
<b>Social</b>			
Safety hazards	*	*	
Development issues	*		
Visitor numbers		*	
Amenities	*		
Information/interpretation	*	*	
Quality of visitor experience	*		
Iwi issues	*?	?	?
Access		*	*
Tourism planning		*	*
Air space	*		*
(Other) management issues	*	*	*

Note: This table indicates the types of comments stakeholders made, but does not indicate the number of comments in each category

#### 6.1 Issues and Concerns – Pancake Rocks

As mentioned earlier, interviewees were assured of confidentiality. For this reason, respondents will not be identified in the following results. The focus of this section is the nature of the issues and concerns while ensuring that no one group's concerns are construed as more valid than others. The responses were quite varied, making generalisations difficult. For this reason, the results shown below are edited versions of the responses, which have then been grouped into themes. A total of 18 respondents commented on the issues and concerns

for Pancake Rocks. Table 6 provides a summary of the theme and the number of respondents who spoke about each issue.

**Table 6.**  
**Pancake Rocks Issues and Concerns**

Issues and Concerns	Issue	Number of Responses
<b>Environmental</b>		
Intentional visitor impact	Graffiti, vandalism	2
Flora impacts	Flora	4
Fauna impacts	Birds	2
Natural processes	Geological issues	5
Site/species protection	(see comments on flora and fauna)	
<b>Social</b>		
Safety hazards	Safety	17
Development issues	Development issues	9
Amenities	Services and facilities, traffic and parking, rubbish collection	20
Information/interpretation	Information and interpretation	4
Quality of visitor experience	Visitors' experience	2
Iwi issues	Iwi issues	2
Air space	Air space	2
(Other) management issues	Site management, flow of people	23

### **6.1.1 Environmental Issues and Concerns**

#### **Intentional Visitor Impacts**

##### *Graffiti and Vandalism*

Two people spoke about the necessity to keep on top of graffiti and vandalism, and that they were concerned about the graffiti on the Nikau Palms and the rocks at the site.

##### **Flora Impacts**

Four respondents spoke about the impacts on the vegetation that is caused by visitors who go off the track to the lookout points. Two of the respondents mentioned the monitoring of the plants at the site as there are a few rare and unique plants that grow in the area.

##### **Fauna Impacts**

Two respondents were concerned about the effects of visitors on birds at the Pancake Rocks site. One person mentioned the terns which nest out on the sea stacks (while most are a reasonable distance away, people can reach one of stacks), and the other person said there are many species in the area that need to be considered when studying impacts.

## **Natural Processes**

### ***Geological Issues***

Respondents expressed concern about:

- erosion on the track over the bridge on the limestone arch (no longer used directly);
- the natural process of erosion;
- the management (by DoC) of natural processes for visitors' safety;
- the stability of the sea bridge;
- the geological stability of the site.

### **Site/species protection (see comments on flora and fauna)**

## **6.1.2 Social Issues and Concerns**

### **Safety**

Most of the respondents mentioned safety issues during the interview. The issues include road safety for pedestrians, safety on the Pancake Rocks site (danger from entering unsafe areas), and plans for re-routing the state highway.

#### *Road Safety for Pedestrians*

Typical responses were:

- buses, logging trucks, dairy trucks, travelling too fast, it's just a question of time before something happens;
- people entering the site safely from the road, particularly when it is very busy;
- congestion on a busy day and large vehicles travelling faster than they should, while
- 'unthinking' visitors wander across the road. It is only a matter of time before a serious accident will occur;
- safe pedestrian access in the upper Punakaiki village needs to be looked at, as does the speed limit on road.

#### *Safety at the Pancake Rocks*

- DoC has to ensure the commitment to safety is met, by keeping a presence on site as much as possible;
- the need to keep safety under control because it's dangerous out there;
- visitor safety is much better now, because people use to go all over the place until about 10 years ago when they put the barriers up;
- the new development has addressed a lot of the visitor safety issues.

#### *Plans for Re-routing the State Highway*

- there is a need to re-route the road around the back of the commercial area, and put in a pedestrian boulevard;
- the plan for a detour around back of shops is a worry, because it will cause massive destruction of natural environment.

#### *Other Safety Issues*

- the interests of safety have overridden conservation issues.

### **Development Issues**

Issues that were brought up under this category included concerns about future development, the over-commercialisation of the area, and the need for further development.

### *Concerns About Future Development*

Respondents in this category thought that:

- even though it is a positive thing that the area attracts so many visitors, some interviewees were concerned about the ability of the facilities to support higher numbers of visitors;
- new buildings have the potential to change the natural character and value of the area by being too intrusive;
- any further development must fit in with what is already there;
- the positioning of Punakaiki in the tourism market and planning for future development must be done in an organised way, rather than ad hoc;
- there is limited freehold land and therefore a limited rating base, which means there are issues for the council as to how to fund and support any further development;
- if too much subdivision is allowed it will lead to sewerage and rubbish disposal problems, as well as overcrowding.

### *Concerns About the Over-commercialisation of the Area*

Respondents thought that:

- the area is becoming too "civilised", commercial/touristy and losing its natural charm;
- some visitors to the area say it's too sanitised, but it has to be this way for visitor safety;
- the development of the 'village' creates a 'touristy' atmosphere that is not in line with the geological features of the site;
- the track is too elaborate, it overpowers the essence of the rocks.

### *Need For More Facilities*

- One respondent thought that there was a need for another restaurant, and that there is a need for a store particularly with fresh food and petrol.

## **Amenities**

### *Services and facilities*

The issues that arose in this category include public toilets, wastewater treatment, and the provision of such facilities.

#### *Public Toilets*

- it's an issue people bring up, the toilets are filthy; who should be responsible?;
- people are going to the toilet in the bushes.

#### *Wastewater Issues*

- wastewater goes from the buildings underground and back out to the sea around Pancake Rocks; if visitors knew this (it could affect their visit);
- there is toxic waste leaking into sea, from an old rubbish dump site, which has made people (who were camping there) sick;
- there are going to be problems in the future for sewerage disposal.

#### *Provision of Facilities*

- DoC own the bulk of the 'commercial' land, there is room for a good DoC centre and more facilities, but DoC has no revenue;
- there isn't a decent water supply around the commercial area (especially for drinking).

### ***Traffic and Parking***

Respondents in this category spoke mainly of the congestion and parking problems in the peak tourist period. There are difficulties in finding a park, and some thought it was potentially dangerous as the state highway goes through the township.

### ***Litter***

Six respondents were concerned about rubbish in the area. The main concern was the lack of rubbish bins in the township (three people thought there should be more bins at the site) and inadequate rubbish collection by the council. One other respondent said that visitors ask them about the lack of bins.

### **Interpretation and Information**

Four people mentioned a need for high quality interpretation of the site, and all agreed that the interpretation panels and the information centre were meeting this need. One of the respondents expressed concern that this level of interpretation is costly and requires a lot of maintenance.

### **Quality of Visitor Experience**

Two people were concerned that the congestion and traffic problems would lead to decreased visitor satisfaction, which has negative implications for the industry on the West Coast.

### **Iwi Issues**

Two respondents mentioned that the site is a significant resource for the harvesting of flax by iwi, which needs to be managed to protect the resource and interpret it in a sensitive manner.

### **Air Space**

Two respondents thought the air space over Pancake Rocks needs protecting from planes flying over. One of the respondents was concerned about the level of noise, saying it would be intrusive, while the other respondent was concerned about the effect this would have on the bird life in the area.

### **Other Management Issues**

#### ***Site Management***

Many varied comments were made about management of the Dolomite Point site (including the commercial area across the road from the track).

#### ***Maintenance***

- the site is expensive to maintain as there is a need for interpretation and keeping up with vandalism;
- there is a need to keep it at a high "world class" standard, therefore it needs a lot of maintenance so it takes up a large portion of DoC's resources;
- weeds need to be controlled;

- it gets such a high use that DoC tries to make sure that it doesn't impact too much on the standard of site;
- managers need to work at security, which is part of managing any public facility.

#### *Natural Character of the Site*

- a local expressed concern over the management of the area's natural assets, saying that the locals care about them and want to see them treated with care by both locals and visitors; however this person thought that it is managed well by DoC and the upgrading was done well;
- there is a need to accommodate people's expectations with protection of the resource and keeping natural character.

#### *Health and Safety*

- monitoring of the natural bridge is an ongoing necessity;
- procedures need to be in place to train staff for activities that need to be undertaken after big events (e.g., earthquakes).

#### *Site Design*

- the rails and flax height are too high for some people to see over;
- there is an ongoing need to keep it natural, one respondent was disappointed with the design of the viewing platform that he thought was intrusive;
- one respondent was concerned about the eroding bolts etc. on new platform structures;
- one person said the area (including the commercial strip) was designed 20 years ago, and is only just coping with the increased number of visitors.

#### *Visitor Impact*

- visitor impact has been reduced by the upgrading which has made it easier to access and to contain people with the use of signs and barriers.

#### *Commercial Issues*

- the seasonality of tourism makes it difficult to run a tourism related business, especially for staffing levels etc.

#### *Flow of people*

The eight respondents in this category spoke about overcrowding at the site, managing the flow of people in the area, managing large numbers of people, and limiting numbers at the site.

#### *Overcrowding*

Respondents mentioned:

- the difficulty in keeping people flowing one way through the site, as it is sometimes hard when large numbers of people, especially tour groups, are on the track;
- too many visitors will make it a bit of a treadmill;
- guests tell local businesses that the area is crowded at peak tourist time and high tide, which often coincide with bus arrivals;
- the area is overcrowded at some peak times.

### *Managing large numbers of visitors*

Two respondents were concerned about the management of large numbers of people that are visiting now and in the future. One other person said that it is important to keep the visitors in one area where they are controllable, thereby minimising impacts.

### *Limiting numbers of visitors*

One respondent said that limiting numbers of people to a site is one device to help look after the resource and reduce the level of impact caused by visitors.

## **Values of the Pancake Rocks/Dolomite Point**

Interviewees value the Pancake Rocks for many reasons. Its most frequently mentioned values were its unique geological structure, the scenic and landscape values, and the commercial opportunities it provides (as an attraction for visitors to the area). Other values include: a habitat for bird life and other wildlife, historical meaning, the accessibility it provides for all visitors, recreational opportunities, the local employment it creates, and as a habitat for rare plants and other vegetation.

## **6.2 Issues and Concerns – Fox River Caves**

Nineteen of the stakeholders commented on issues and concerns at the Fox River Caves. During the interviews, the conversation often expanded to include other caves in the Paparoa National Park. Table 7 lists the issues and concerns mentioned by stakeholders.

**Table 7. Fox River Caves Issues and Concerns**

<b>Issues and Concerns</b>		<b>Issue</b>	<b>Number of Responses</b>
<b>Environmental</b>			
1.	Intentional and unintentional visitor impact	Visitor impact/damage, graffiti/vandalism, transfer of mud/dirt	23
2.	Flora impacts	Cave flora	1
3.	Fauna impacts	Cave fauna	2
4.	Site/species protection	Protection of caves	2
<b>Social</b>			
5.	Safety hazards	Visitor safety	8
6.	Visitor numbers	Visitor numbers	6
7.	Information/interpretation	Information/interpretation	3
8.	Access	Access	1
9.	Tourism planning	Promotion of cave to visitors	2
10.	(Other) management issues	Other	3

## **6.2.1 Environmental Issues and Concerns**

### **Intentional and Unintentional Visitor Impact**

#### **Visitor Impact/Damage**

##### *General comments*

Stakeholders comments in this category reflected their concern about the various impacts caused by visitors to the caves. The comments received were usually not specific, for example, “*because they are so unique any damage is a concern*”, “*damage of fragile areas*”, or the respondent listed a range of possible impacts such as “*damage to the ground formations, trampling*”, “*damage caused by mud, broken formations, vandalism*”.

##### *Damage to formations*

Some stakeholders were concerned specifically about the damage to the formations. Their concerns extended to the impact this has on the cave system, especially as the formations are “*worth protecting*” for their own sake, as well as the visitor safety aspect of broken formations as they can be very sharp and could injure anyone who falls on the broken pieces.

##### *Other comments*

Four other comments were made in relation to visitor impact or damage. These people were concerned about the impact of rubbish in the cave, people camping in them and lighting fires, people pushing past the taped areas and going into sensitive areas, and the damage to the cave floor by trampling.

#### **Graffiti/Vandalism**

Four people’s concerns were specifically about graffiti or other vandalism in the caves. Some of this type of damage dates back to early this century, and is an ongoing problem that is difficult to control. One person was concerned that now graffiti is occurring in backcountry huts that it is just a matter of time before someone goes into the cave and “*smashes it up*”.

#### **Transfer of Mud/Dirt**

Three stakeholders were concerned about the transfer of mud or dirt inside the cave, mainly from people’s shoes and hands, which then damages the surfaces of the cave. Fox River cave has been cleaned to reduce this impact, and although a taped route was laid to show people the safest route to take, mud continues to be a problem in the cave.

### **Flora Impacts**

#### **Cave Flora**

One person was concerned about the management of vegetation in the twilight zone, which tends to be fragile.

### **Fauna Impacts**

#### **Cave Fauna**

A couple of interviewees said they were concerned about impacts on cave fauna, such as “*wetas, glowworms, spiders and other things you can’t see*”. One person thought that people don’t appreciate what lives in the caves.



## **Site/Species Protection**

### **Protection of Caves**

These people thought that protecting the caves should be a high priority as they are fragile and unique environments in the Buller area.

## **6.2.2 Social Issues and Concerns**

### **Safety Hazards**

Most of the respondents in this category were concerned about people visiting any caves in the Paparoa National Park, especially as many of them are prone to flooding after heavy rain in the back country (although this is not the case for Fox River caves). This risk, along with others inherent in caving activities, put other people's lives at risk if visitors require rescuing. One of the respondents was concerned about people injuring themselves on broken formations inside the caves.

### **Visitor Numbers**

Four of the respondents mentioned that visitor numbers to the Fox River caves (and most other caves in the National Park) are unknown. This makes it difficult to define impact levels and draw up management plans. One person thought that the caves were already over-used. Two others were concerned about control over entry to the caves, or lack of control, and the possibility of large numbers of people going through the caves. DoC staff said they are working with concessionaires and large groups to educate visitors about cave etiquette, and to improve the communication of DoC's management goals.

### **Information/Interpretation**

Two respondents said there is a need for better public education about the appropriate behaviour inside a cave, as well as interpretive information about the cave environment. Another concern was raised about the signage in the car park stating that it is a "tourist" cave, which implies that it is relatively safe for anyone to have a look at. This person was worried that the sign is misleading, as the cave is potentially dangerous, or that visitors lacking knowledge about caves may do irreparable damage.

### **Access**

According to one respondent, the Fox River caves are very accessible and reasonably safe, and because of this there is a need for better information for the public regarding what equipment to take in on their visit and other general information about the cave. This person also thought there should be more access allowed to other caves in the area, especially for guided groups.

## **Tourism Planning**

### **Promotion of the Caves to Visitors**

One stakeholder thought there should be better, more organised promotion of the caves to visitors. This would encourage visitors to stay longer in the area and therefore benefit businesses. Another person said there is a need for transport to the caves from Punakaiki for visitors without transport.

## **(Other) Management Issues**

### *Fox River Caves*

Other comments about Fox River caves include (one each of) the security of vehicles in the car park, the erosion of the track to the cave, and the amount of maintenance needed for the track to the caves.

### *Other caves in Paparoa National Park*

Some stakeholders expressed concerns about other caves in the Paparoa National Park, and other areas on the West Coast, however as these caves were not the focus of this study or the questioning, the extra comments have been excluded from this report.

## **6.3 Issues and Concerns – Westland Petrel Colony**

Fifteen stakeholders responded to questions about the Westland Petrel Colony. Their comments were about two parts of the colony: one is on DoC land, and the other is a sub-colony on private land, where the landowner operates a petrel viewing business. Below is a list of the issues and concerns stakeholders have about the petrel colony (Table 8).

**Table 8. Westland Petrel Colony Issues and Concerns**

<b>Issues and Concerns</b>		<b>Issue</b>	<b>Number of Responses</b>
<b>Environmental</b>			
1.	Flora impacts	Predator control, disruption to flight path, farm animals	19
2.	Site/species protection	Protection	7
<b>Social</b>			
3.	Access	Access	5
4.	Tourism planning	Planning for tourism	5
5.	Air space	(see comments under “other”)	1
6.	(Other) management issues	Other	3

### **6.3.1 Environmental Issues and Concerns**

#### **Fauna Impacts**

##### **Predator control**

Most stakeholders were concerned about the control of predators in the colony. There are many different predators likely to affect the colony, such as stoats, possums, wekas, goats, and feral cats. DoC runs a predator control program to maintain low levels of predators.

##### **Disruption to flight path**

Eight of the respondents were concerned about land-based disruptions to the birds’ flight path. Power lines and lights from buildings and vehicles are hazards for the birds when they fly in to their breeding area in the early evening. DoC has been trying to work with the power company to put the lines underground. To date, one section has been relocated but according to several of the respondents, more of the lines need to be underground as they are still causing problems for the birds. While the colony is not in the Buller District, the flight path

is, so the council has added rules to the district plan to include a requirement that lights be hooded.

### **Farm animals**

Two people said they were concerned about the impact of farm animals on the petrels. According to one of them, the fencing of surrounding properties was not sufficient to stop cattle from entering the site. They did, however, acknowledge that most of the farms surrounding the colony have been de-stocked or sold off for lifestyle blocks.

### **Site/ species protection**

Long-term protection of the petrels was the main concern for these respondents. This included protection of their habitat, and from future development in the area. One person said that since the breeding area has been protected, he has noticed an increase in the number of birds in the colony.

## **6.3.2 Social Issues and Concerns**

### **Access**

There were a few different access issues that arose in the interviews. Some stakeholders thought that the numbers of people visiting the colony on DoC land should be controlled (this is currently done through a permit system). Others were concerned about people interfering with the birds through unauthorised access. They also said that there should be absolutely no access to the general public as the burrows are so close together, and the terrain rugged and slippery, that damage can occur quite easily. One person pointed out that visitors can access the petrels via the nature tour company, so there is no need for public to access the DoC land. Another respondent thought that there was room to open up a sub-colony on the DoC land to visitors, which would generate income to help predator control. In an opposing view, another person was concerned about the impact of such tourism operations in the DoC colony, which they thought would create a greater demand to see the birds (through promotion of the site) and thereby increase the risks the birds are exposed to.

### **Tourism Planning**

Two of these people said that the colony on private land is a commercial draw card for the area, and while they did not want to endanger the birds any further, they would like to see this attraction developed more. The other three respondents spoke about the frustrations they have experienced with the lack of information from the nature tour operator about the details of the tours (such as times, prices etc). This has only occurred more recently, however it has made promotion of the attraction difficult for these people who wanted to provide their visitors with information on the tours.

### **Other**

Three other issues arose: the need for a no-fly zone over the colony, the recovery of injured birds, and threats at sea. The first respondent said a no-fly zone is needed over the colony in the breeding season, and that DoC staff are trying to achieve this outcome. Another person was concerned about who was responsible for the care of injured birds, and suggested that it be addressed in the draft recovery plan for the colony. The third stakeholder indicated that there was a need for more information about the threats at sea for the birds, as there is anecdotal evidence that they have been breeding well since the fisheries have been operating

on the coast, by feeding on waste and by-catch. The extent to which birds are caught in the fishing lines off the back of the boats is not yet known.

## Chapter 7

### Stakeholder Suggestions for Indicators of Change

Table 9 (see page 41) summarises the comments on indicators of change at each of the three sites. Further details about the nature of the comments made are reported in the following sections.

#### 7.1 Stakeholder Suggestions for Indicators of Change at Pancake Rocks/Dolomite Point

The stakeholders were asked to suggest appropriate and measurable indicators of environmental change at Pancake Rocks. The list below shows these indicators by theme and the comments made on each one. The comments were grouped and listed as one comment if they were the same or similar to others. The stakeholder groups in this case are also listed. Suggested indicator themes for Pancake Rocks include: flora, fauna, trampling impacts/erosion, vandalism/graffiti, visual impacts, rubbish, geological, toilets, vehicles, visitor numbers, visitor satisfaction and motivation, and water quality.

##### 7.1.1 Environmental Indicators – Pancake Rocks

###### Flora

Stakeholder groups:

- Department of Conservation
- Tourism Operators
- Local businesses
- Buller District Council

###### *Comments*

- health of the plant life over the barriers (evidence of good plant growth under platforms)
- number of rare plants - look at impact on those
- test plots of vegetation - most of the damage had already been done by forming highly unnatural and obvious walkways, walls, steps etc
- plant life/plants - monitor rare plants
- statistically sampling what is there now in terms of vegetation, Nikau palms, rare vegetation etc e.g. population of birds, then correlate this with what people feel specimen numbers should be there and monitoring to see if there are adverse affects with the area's use
- vegetation monitoring - not sure how this is done, but some method of determining damage or re-growth to the vegetation around the whole track

## **Fauna**

Stakeholder groups:

- Local residents
- Tourism Operators
- Local businesses

*Comments*

- bird populations, particularly waders, oystercatchers, heron, pukeko, weka, shags in the swamps and estuary
- effects on birds
- fauna counts i.e., bird numbers and other types in the immediate area
- increase in scavenging seagulls
- numbers of birds nesting

## **Unintentional Visitor Impacts**

Stakeholder Groups:

- Local residents
- Department of Conservation
- Local businesses
- Buller District Council

*Comments*

- damage caused by people walking off the track
- the width of the track - the 'manicure' line is getting wider
- look at damage off tracks when people leave the path
- people going off the track - they crush plants off the track
- anything unnatural wearing away the physical attributes of the site
- erosion on tracks from people's feet
- measure whether some of the erosion is caused by people, there will be natural erosion anyway
- the erosion of vegetation, tracks, hopefully people aren't going to go off
- trampling effects on the creeping low vegetation

## **Intentional Visitor Impacts**

Stakeholder Groups:

- Local businesses

*Comments*

- the graffiti especially on the Nikau palms
- vandalism - the donation box has been tampered with in the past

## **Natural Processes/Geological**

Stakeholder Groups:

- Buller District Council

*Comment*

- measuring of slumping of sea bridge, regardless of whether people are walking over it or not, it's probably something that should be measured (especially from liability point of view)

## **Water Quality**

Stakeholder Groups:

- Tourism operators

*Comment*

- water quality monitoring needs to start urgently i.e. Punakaiki River quality, ground flow quality, seawater quality, Paparoa Park streams quality

### **7.1.2 Social Indicators – Pancake Rocks**

#### **Visual Impacts**

Stakeholder Groups:

- Local businesses

*Comment*

- visual impact e.g., buildings and structures, have a photo of the present state and that's how it should stay

#### **Amenities**

#### **Rubbish**

Stakeholder Groups:

- Local businesses

*Comment*

refuse/rubbish situation whether it's causing any damage

#### **Toilets**

Stakeholder Groups:

- Department of Conservation

*Comment*

- in commercial area – usage of toilets (number of times tanks need to be emptied)

#### **Visitor Numbers**

#### **Vehicles**

Stakeholder Groups:

- Tourism Operators
- Local businesses

*Comments*

- total number of vehicles and type i.e., private car, campervans, buses, bikes etc.
- traffic going through and categorise it as to what type of vehicle it is, including cyclists; and tie it into waste management

#### **Visitor Numbers**

Stakeholder Groups:

- Department of Conservation
- Tourism operators

*Comments*

- total number of visitors that access the walkway
- track counter set up to measure numbers of people
- visitor numbers to the site

**Quality of Visitor Experience**

Stakeholder Groups:

- Department of Conservation
- Tourism Operators

*Comments*

- visitor's enjoyment of the area
- what the real objectives are for people to visit. Do they know what they are looking at? Or is this just a quick stopover?



**Table 9. Indicators of Change Suggested by Stakeholders**

	<b>Pancake Rocks/Dolomite Point Impacts</b>	<b>Fox River Caves Impacts</b>	<b>Westland Black Petrel Colony Impacts</b>
<b>Environmental</b>			
Flora impacts	Health, quantity, visitor damage	Health, vegetation types	Vegetation changes
Fauna impacts	Population sizes	Monitor fauna species	Predators, population dynamics
Unintentional visitor impact	Trampling erosion	Trampling, erosion, transfer of mud/dirt by foot and hand prints, discolouration of walls	Bird behaviour
Intentional visitor impact	Graffiti, vandalism	Graffiti, damage to formations damage or removal of skeletons or fossils, litter	Sign of illegal entry, effects of visitors, visitor behaviour
Natural processes	Natural erosion	Growth of formations (see comments under intentional impacts above)	
Water quality	Groundwater, sea water, freshwater quality	Water quality in cave	
External impact			Fisheries, flight paths
<b>Social</b>			
Visual impacts	Effects of new buildings and development on aesthetic values		
Amenities	Provision of adequate toilet facilities, rubbish		
Visitor number	Vehicle numbers and types, visitor numbers	Number of visitors to site, number of enquiries at information centre	
Quality of visitor experience	Visitor satisfaction and motivation		
Noise		Noise levels	
Safety hazards		Monitor safety hazards	
Stakeholder communication		Regular, ongoing communication between concession holders and DoC	

## **7.2 Stakeholder Suggestions For Indicators of Change at Fox River Caves**

Below are suggestions by stakeholders for possible indicators of environmental change in the Fox River caves. The number of comments listed does not represent the total number of comments received in each category. These responses have been edited to indicate the types of indicators respondents thought would be appropriate and measurable. The stakeholder groups that made comments for each theme are listed at the beginning of each theme. Stakeholders suggested that useful indicators include those that look at impacts: on vegetation, formations, fauna, of graffiti/vandalism, litter, erosion/trampling, on water quality, skeletons/fossils, of foot and hand prints, visitor numbers and demand, the movement of mud, noise, safety hazards and concessions.

### **7.2.1 Environmental Indicators – Fox River Caves**

#### **Flora Impacts**

Stakeholder Groups:

- Tourism operators

#### *Comments*

- Types, and state of health, of vegetation around cave entrance

#### **Fauna Impacts**

Stakeholder Groups:

- Caving 'expert'
- Local residents
- Local businesses

#### *Comments*

- monitor cave life
- spiders
- count bugs

#### **Unintentional Visitor Impacts**

#### **Erosion/Trampling Impacts**

Stakeholder Groups:

- Department of Conservation
- Local businesses

#### *Comments*

- width of the path (if it gets wider or muddier)
- trails/ how the site looks in terms of tracks will give an indication of use
- erosion (of channels people move through)
- wear on ground formations/wear and tear

#### **Foot prints/Hand Prints**

Stakeholder Groups:

- Department of Conservation

### *Comments*

- hand marks/ muddy hand prints
- foot marks/footprints on floor (in cavern)

### **Movement of Mud**

#### Stakeholder Groups:

- Department of Conservation
- Local businesses

### *Comments*

- mud trekked in / any tracking of mud
- amount of mud and necessity for cleaning
- discolouration (of walls etc.)

### **Intentional Visitor Impacts**

### **Graffiti/Vandalism**

#### Stakeholder Groups:

- Department of Conservation
- Tourism Operators
- Local businesses

### *Comments*

- monitor graffiti/vandalism
- monitor visual impacts (vandalism?)

### **Litter**

#### Stakeholder Groups:

- Department of Conservation

### *Comment*

- rubbish – I've seen snack papers etc., carbide gas canisters for lamps

### **Formations**

#### Stakeholder Groups:

- Caving 'expert'
- Department of Conservation
- Local residents
- Local businesses
- Tourism Operators

### *Comments*

- monitoring the growth of formations
- amount of broken formations/visual damage of formations
- state of the formations, how in tact they are and how clean they are
- monitor physical features
- damage to wall and ceiling formations

### **Skeletons/Fossils**

Stakeholder Groups:

- Department of Conservation

*Comments*

- skeletons and fossils broken or removed

### **Natural processes**

(see comments on formations above)

### **Water Quality**

Stakeholder Groups:

- Caving 'expert'
- Tourism Operators
- Local businesses

*Comment*

- water quality in cave (mud in pools etc)/ water quality measurements

## **7.2.2 Social Indicators – Fox River Caves**

### **Visitor Numbers/Demand**

Stakeholder Groups:

- Tourism operators
- Buller District Council

*Comments*

- the number of enquiries at visitor centre would give you some indication of the number of people who want to go
- possibly total visitor numbers
- some places are gated so you can get an idea of visitor numbers

### **Noise**

Stakeholder Groups:

- Local businesses

*Comment*

- too much loud noise

### **Safety Hazards**

Stakeholder Groups:

- Local businesses

*Comment*

- monitor safety hazards

## **Stakeholder Communication**

Stakeholder Groups:

- Department of Conservation

*Comment*

- (ensure that) concession operators in Charleston have regular contact with DoC

## **Other comments**

Stakeholder Groups:

- Department of Conservation
- Caving 'expert'

*Comments*

- each cave needs to be looked at differently, and scientific programs should be worked out
- each cave has own values - important to determine what you are trying to detect; that you are getting baseline information, getting specialists knowledge about what is important; values are hard to determine
- establish what the situation is now, compare that to untouched caves and seeing how that is deteriorating

## **7.3 Stakeholder Suggestions for Indicators of Change at the Westland Petrel Colony**

The indicators listed here reflect the issues and concerns mentioned above. These comments have been grouped into the following categories: predators, population dynamics, fishing impacts, bird behaviour, flight path issues, illegal entry, management of people within the site, and vegetation changes. Again, not all of the comments are included here.

### **7.3.1 Environmental Indicators – Westland Black Petrel Colony**

#### **Flora Impacts**

Stakeholder Groups:

- Local businesses

*Comment*

- establish a test plot to observe vegetation changes

#### **Fauna Impacts**

##### **Predators**

Stakeholder Groups:

- Department of Conservation
- Tourism Operators
- Local Businesses

*Comments*

- whether predators are increasing or decreasing/the presence of predators
- predator effects, because you have a track going into the colony that's going to attract predators such as cats, dogs, stoats etc, but you need a control to tell you if it's normal or abnormal

## **Population Dynamics**

### Stakeholder Groups:

- Department of Conservation
- Local businesses
- Tourism operators
- Buller District Council

### *Comments*

- general population and health of colony, needs to be ongoing/ count the birds, nests, young
- population size, what birds come back etc/ recruitment - the amount of eggs that survive and go out to sea then come back
- population whether it's expanding, stable, going down, not something you can do quickly
- mortality
- migration patterns
- number of chicks/ egg/chick survival
- breeding success - but petrels are such slow breeders that it might take 10 years for you to pick a trend out and in that time you might have caused a lot of damage, so you can't run trips to a petrel colony and monitor it for only a couple of years and say there is no impact
- burrow activity - there are a lot of burrows not used, which may be indication of past population levels, although a lot of those 'dead' burrows are not able to be used because they are worn out - too wet or collapsed in the nesting area, they don't often build new nests

## **Unintentional Visitor Impact**

### Stakeholder Groups:

- Local businesses

### *Comment*

- monitor bird behaviour to see if they are affected by people or lights but you can only do this while there are people at the site

## **Intentional Visitor Impact**

### Stakeholder Groups:

- Department of Conservation
- Local businesses
- Buller District Council

### *Comments*

- unauthorised or illegal entry signs (physical signs)
- measuring effects of tourists – but some impacts are not necessarily tourist related
- check visitors accessing private and DoC land

## **External Impacts**

## **Fishing Impacts**

### Stakeholder Groups:

- Department of Conservation

#### *Comment*

- fishing impacts e.g., getting caught in lines, is this a major issue?

#### **Flight Path Issues**

Stakeholder Groups:

- Local businesses
- Buller District Council

#### *Comments*

- record problems with birds getting to the site e.g., power lines, passing cars etc.
- observe flight paths and map them

### **7.4 Summary Evaluation – Pancake Rocks Stakeholder Interviews**

Stakeholders generally spoke about the broader Dolomite Point area, including the commercial strip across the road from the entrance to the Pancake Rocks. The most frequently mentioned concern was visitor safety, not only while visitors walk around the rocks but also when they access the entrance to the attraction, especially as the highway can be dangerous. Issues to do with management of the Punakaiki area also arose during the interviews. While recognising that the site requires a lot of maintenance to keep it at a high standard, stakeholders were also concerned about retaining the character and naturalness of the area (especially for future development) and minimising environmental impacts. Some already think that the area is too commercialised. The sheer number of people visiting the site at peak times tends to cause congestion and flow problems both on the track and in the car parks. There was also a call for more facilities such as better rubbish collection points and disposal, more/better public toilets, more parking areas, and a reliable water supply.

Currently the Department of Conservation is monitoring the geological stability of the site. A geologist carries out survey and photo monitoring for the Department every six months. The Department also performs regular monitoring of the ecological values of the site and checks for any adverse affects from visitors to the site. Since a large amount of information is already being collected at the site, this information can be easily fed into a Limits of Acceptable Change (LAC) framework without dramatic change to the functions already performed by DoC staff. However, the list of potential indicators specified by stakeholders should be reviewed by biological/ecological experts and amended (in consultation with DoC) to include those indicators that are appropriate for this site and are in line with management goals. If they choose to implement the LAC system, DoC will need to check this list against their current monitoring and make changes where necessary. The success of the LAC system will be determined by the commitment to, *and continuation of*, the goals and steps outlined in the planning system.

### **7.5 Summary Evaluation – Fox River Caves Stakeholder Interviews**

Stakeholders were mostly concerned about managing the many different types of visitor impacts inside the caves, but especially damage to the formations. Improving visitor safety was also an issue for many of the respondents. The issues brought up in the interviews were often applicable to all caves in the National Park, and are probably valid for many other caves around the country to some degree. Lack of information on visitor numbers makes planning for use of these environments difficult, however there are plans for DoC to install a track counter in the near future, which will aid managers in prioritising their resources.

The indicators listed by stakeholders were quite comprehensive. The Department of Conservation is currently monitoring impacts through a photo monitoring system, however this does not cover everything suggested by the stakeholders. As with the indicators for Pancake Rocks, “experts” must review the list of potential indicators for Fox River caves to establish a complete list that is appropriate for the management goals.

## **7.6 Summary Evaluation – Westland Petrel Colony**

Stakeholders were primarily concerned with protection of the birds, through predator control, clear flight paths, and limited access to the birds. Several people were also interested in increasing the promotion of the colony as a commercial attraction in the area, while at the same time ensuring minimal impacts on the birds.

Both DoC and the nature tour operator are monitoring birds in the colony. The Department monitors a sub-colony on DoC land, and the commercial operator studies the birds on their property in a monitoring program that they set up about 10 years ago. The list of stakeholder indicators should go through a process of refinement with management and “experts”, after which they can review the type of monitoring they are doing and check that they are meeting the management goals for the colony as well as maintaining the biological and ecological integrity of the colony site. The nature tour operator may also want to consider indicators for positive visitor experiences. The steps DoC and the operator have taken appear to be very similar to those outlined in the LAC planning system, however they must ensure the ongoing commitment to their goals for the petrel colony if they want to implement LAC.



## Chapter 8

### Summary

This report outlines the issues and concerns about three natural attractions in the Paparoa National Park. If the LAC planning system is to be implemented here, management will need to review these findings and work out how each issue is to be addressed.

The indicators of change suggested by the stakeholders must go through a refining process with biological experts and managers to determine those indicators that are appropriate, measurable and in-line with management goals. Stakeholders were generally more concerned about the “back stage” issues at the sites such as safety, parking, maintenance etc. The visitors to the Pancake Rocks were more concerned about “front stage” issues (such as the look of the track, or poor weather), however there were no major negative issues for visitors at this site. Damage or impact caused by visitors was the major issue for Fox River Caves in both the visitor survey and the stakeholder interviews. This is clearly an issue that requires urgent attention by management, and may be alleviated through educational programmes, which the Department of Conservation has already commenced. At the Westland Petrel Colony, protection of the birds was the main concern for most stakeholders, and is the main management priority for the colony.

The issues, concerns and indicators varied greatly (even sometimes within a stakeholder group), emphasising that public consultation on management of these areas will be necessary to gain support for management decisions and to ensure the long-term success of the park as a visitor attraction in the region. In doing so, the stakeholders will need to consider a balance between sustaining the environmental values of the area with the economic viability of the local and national business that bring income to the area. All of the stakeholders expressed concerns about protecting the environmental integrity of the sites, even when discussing economic opportunities.

Once management goals have been clearly defined, planning the next steps of the LAC system can begin. Standards for the indicators at each site need to be specified to determine the acceptable limits of each condition, and opportunity classes need to be defined (Stankey et al, 1985). Eventually, the standards of the selected indicators will be continuously monitored, and the information will then be continuously fed back into the system to check for unacceptable changes. In this way, it is easy for new indicators to be added to the system, or redundant ones discarded. The success of this system depends entirely on the long-term commitment to monitor changes by both management and stakeholder groups.



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## **Appendix 1. Pancake Rocks Visitor Survey**



Environment and Experience at the Pancake Rocks

A study conducted by the

## Tourism Research and Education Centre (TREC)



LINCOLN  
UNIVERSITY

*T e W h a r e W ā n a k a O A o r a k i*



The Tourism Research and Education Centre (TREC) at Lincoln University has been funded by the Foundation for Research, Science and Technology to investigate changes in the environment of the West Coast on which tourism depends. We would like you to assist this study by providing information on your experience of the natural attractions in the Punakaiki area. We are interested in your visit to the Pancake Rocks (Dolomite Point), and the tracks you used to visit this site. What things added to your enjoyment of your visit to these sites, and what detracted from your enjoyment? By answering these sorts of questions, as well as a few visitor profile questions, the team from TREC can inform managers about the issues and concerns visitors have for these sites. This information will be integrated into the planning process to ensure appropriate management of these unique natural resources.

Your participation in this study is voluntary, however only a select number of visitors to the West Coast will be asked to complete a survey, so your assistance is very important. This questionnaire will take about 10-15 minutes to complete, and all answers will be kept confidential.

If you have any questions about this study please contact the project leaders at TREC:

Dr Jonet Ward or

Dr Ken Hughey

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**BEFORE YOU START** – Please ensure that only **ONE** person per group complete this survey

**VISITOR PROFILE**

**Q1.** Where do you normally live? Town/City: \_\_\_\_\_  
Country: \_\_\_\_\_

**Q2.** What size is the group you are with? Adults: \_\_\_\_\_  
Children: \_\_\_\_\_

**Q3.** Who are you visiting this site with? *(Please tick)*

- |   |  |   |
|---|--|---|
| <input type="checkbox"/> 1. Visiting alone      | <input type="checkbox"/> 2. Partner/Spouse             | <input type="checkbox"/> 3. Friends                               |
| <input type="checkbox"/> 4. Family              | <input type="checkbox"/> 5. Friends and partner/spouse | <input type="checkbox"/> 6. Friends and family                    |
| <input type="checkbox"/> 7. Business associates | <input type="checkbox"/> 8. Special interest group     | <input type="checkbox"/> 9. Other <i>(please specify)</i> : _____ |

**Q4.** Are you *(please tick)*:

- Male                       Female                      *(please answer for yourself only)*

**Q5.** What is your age group? *(please tick)*

*(please answer for yourself only)*


- |                                |                                |                                |                                |
|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| <input type="checkbox"/> 15-19 | <input type="checkbox"/> 30-34 | <input type="checkbox"/> 45-49 | <input type="checkbox"/> 60-64 |
| <input type="checkbox"/> 20-24 | <input type="checkbox"/> 35-39 | <input type="checkbox"/> 50-54 | <input type="checkbox"/> 65-69 |
| <input type="checkbox"/> 25-29 | <input type="checkbox"/> 40-44 | <input type="checkbox"/> 55-59 | <input type="checkbox"/> 70+   |

**Q6.** How long is your present holiday in **New Zealand** (in days/months)? \_\_\_\_\_

**Q7.** How long is your present holiday on the **West Coast** (in days/months)? \_\_\_\_\_

**PANCAKE ROCKS SPECIAL VALUES**

**Q8.** Different people think that places are special for many different reasons. Think about your visit to **Pancake Rocks** today and the reasons why **you** think it is a special place. Below is a list of reasons why these sorts of places are valued by people. Please indicate which values you associate with Pancake Rocks that are the most important to you by drawing a line between the item in the left hand column and the ranking in the right hand column.

**Example** ○-----○  ○

**Reasons why people might value Pancake Rocks:**

- |                                   |  |
|-----------------------------------|--|
| historical meaning ○              |  |
| conservation values ○             | ○ 1. The is the <b>most</b> important to me        |
| cultural values ○                 |  |
| recreational opportunities ○      |  |
| economic opportunities ○          | ○ 2. The is the <b>second</b> most important to me |
| geological values ○               |  |
| educational opportunities ○       |  |
| scientific research ○             | ○ 3. The is the <b>third</b> most important to me  |
| ecological values ○               |  |
| OTHER <i>(please specify)</i> : ○ |  |

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**ENJOYMENT OF PANCAKE ROCKS**

**Q9.** Think about your visit to the **Pancake Rocks**. Were there things that stand out as **adding** to your enjoyment of your visit here?

- No → If *no*, please go to question 10 below
- Yes



If *yes*, please tell us what these things were and where each occurred (eg. at the track entrance).

- a. The thing that added most to my enjoyment was: \_\_\_\_\_  
Where did it occur? \_\_\_\_\_
- b. Another thing that added to my enjoyment was: \_\_\_\_\_  
Where did it occur? \_\_\_\_\_
- c. Will the things that added to your enjoyment affect your use of this site in future? (*please tick*)
  - no
  - yes – I would come here more often
  - other (*please specify*): \_\_\_\_\_

**Q10.** Were there things that stand out as **detracting from** your enjoyment of your visit here?

- No → If *no*, please go to question 11 below
- Yes



If *yes*, please tell us what these things were and where each occurred (eg. at the track entrance).

- a. The thing that detracted most from my enjoyment was: \_\_\_\_\_  
Where did it occur? \_\_\_\_\_
- b. Another thing that detracted from my enjoyment was: \_\_\_\_\_  
Where did it occur? \_\_\_\_\_
- c. Will the things that detracted from your enjoyment affect your use of this site in future? (*please tick*)
  - no
  - yes – I would not return here again
  - yes – I would not come here as often
  - yes – I would go somewhere else for a similar experience (for scenery, walking etc)
  - other (*please specify*): \_\_\_\_\_

**Q11.** Have you visited Pancake Rocks before today? (*Please tick*)

- No → (go to Question 12)
- Yes → If *yes*,

- a. when was your last visit to Pancake Rocks (month/year)? \_\_\_\_\_
- b. how often would you *usually* visit Pancake Rocks? (*please tick below*)
  - once a month or more
  - about once a year
  - once every few years
  - occasionally in my lifetime



**Q13. Overall, how would you rate your visit to the Pancake Rocks? (Please circle)**

1.....2.....3.....4.....5.....6.....7.....8.....9.....10  
poor                      fair                      good                      very good                      excellent

**This is the end the survey. Please hand the survey in to the person who gave it to you.  
Thank you very much for your time. We hope you enjoy the rest of your visit to the West Coast!**

**ANY OTHER COMMENTS? Please write them here. These comments will be passed on to the Department of Conservation.**

## **Appendix 2. Fox River Caves Visitor Survey**



Environment and Experience at Fox River Caves

A study conducted by the

**Tourism Research and Education Centre (TREC)**



The Tourism Research and Education Centre (TREC) at Lincoln University has been funded by the Foundation for Research, Science and Technology to investigate changes in the environment of the West Coast on which tourism depends. We would like you to assist this study by providing information on your experience of the natural attractions in the Punakaiki area. We are interested in your visit to any caves in the area, and the tracks you used to visit these sites. What things added to your enjoyment of your visit to these sites, and what detracted from your enjoyment? By answering these sorts of questions, as well as a few visitor profile questions, the team from TREC can inform managers about the issues and concerns visitors have for these sites. This information will be integrated into the planning process to ensure appropriate management of these unique natural resources.

Your participation in this study is voluntary, however only a select number of visitors to the West Coast will be asked to complete a survey, so your assistance is very important. This questionnaire will take about 10-15 minutes to complete, and all answers will be kept confidential.

If you have any questions about this study please contact the project leaders at TREC:

Dr Jonet Ward or

Dr Ken Hughey

Tourism Research and Education Centre and Environmental Management and Design Division

PO Box 84

Lincoln, Canterbury

Tel: (03) 325 2811

Email: [wardj@kea.lincoln.ac.nz](mailto:wardj@kea.lincoln.ac.nz) or [hugheyk@lincoln.ac.nz](mailto:hugheyk@lincoln.ac.nz)

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**BEFORE YOU START** – Please ensure that only **ONE** person per group complete this survey

**VISITOR PROFILE**

**Q1.** Where do you normally live? Town/City: \_\_\_\_\_  
Country: \_\_\_\_\_

**Q2.** What size is the group you are with? Adults: \_\_\_\_\_  
Children: \_\_\_\_\_

**Q3.** Who are you visiting this site with? (*Please tick*)

<input type="checkbox"/> 1. Visiting alone	<input type="checkbox"/> 2. Partner/Spouse	<input type="checkbox"/> 3. Friends
<input type="checkbox"/> 4. Family	<input type="checkbox"/> 5. Friends and partner/spouse	<input type="checkbox"/> 6. Friends and family
<input type="checkbox"/> 7. Business associates	<input type="checkbox"/> 8. Special interest group	<input type="checkbox"/> 9. Other ( <i>please specify</i> ): _____

**Q4.** Are you (*please tick*):

<input type="checkbox"/> Male	<input type="checkbox"/> Female	( <i>please answer for yourself only</i> )
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**Q5.** What is your age group? (*please tick*) (*please answer for yourself only*)

<input type="checkbox"/> 15-19	<input type="checkbox"/> 25-29	<input type="checkbox"/> 35-39	<input type="checkbox"/> 45-49
<input type="checkbox"/> 55-59	<input type="checkbox"/> 65-69	<input type="checkbox"/> 20-24	<input type="checkbox"/> 30-34
<input type="checkbox"/> 40-44	<input type="checkbox"/> 50-54	<input type="checkbox"/> 60-64	<input type="checkbox"/> 70+

**Q6.** How long is your present holiday in **New Zealand** (in days/months)? \_\_\_\_\_

**Q7.** How long is your present holiday on the **West Coast** (in days/months)? \_\_\_\_\_

**Q8.** Which cave(s) did you visit in this area on **this trip**? (*please list all caves*) \_\_\_\_\_

**Q9.** Was this your **first** visit to a cave (anywhere in the world)? (*Please tick*)

Yes (go to Q10 below) ↓  No → If **no**, please complete the following about your previous caving experience:

- a. Number of times I have visited caves before:
 

<input type="checkbox"/> once	<input type="checkbox"/> a few in my lifetime	<input type="checkbox"/> at least once a year
-------------------------------	---	---
- b. Do you belong to a caving/speleological club?  yes  no
- c. Have you visited caves on the West Coast before this trip?
 

<input type="checkbox"/> no (go to Q10 below) ↓	<input type="checkbox"/> yes (continue Q9d)
---	---
- d. On how many days have you visited caves over the last 12 months on the **West Coast**?
 

<input type="checkbox"/> none	<input type="checkbox"/> 6 – 10 days
<input type="checkbox"/> up to 1 day	<input type="checkbox"/> 10 – 15 days
<input type="checkbox"/> 2 – 3 days	<input type="checkbox"/> > 15 days
<input type="checkbox"/> 4 – 5 days	
- e. How many visits have you made to each of the following West Coast caves over the last 12 months?
 

Punakaiki cavern _____	Fox River cave _____
Babylon _____	Metro _____
Honeycomb Hill _____	Other caves: ( <i>please name</i> ) _____

**Q9 continued**

f. Are you aware of the restricted entry conditions for any West Coast caves ?

- yes (*please name the cave*) \_\_\_\_\_
- no

g. If you answered yes to f (above), do these restricted entry conditions affect your use of that cave ?

- no
- yes – I don't use the cave because of the restrictions
- yes – I use the cave less because of the restrictions
- yes – I use the cave more because of the restrictions
- yes – I use other caves because of the restrictions
- other (please specify) \_\_\_\_\_

**Q10.** Which cave on the West Coast did you **last** visit? \*\*

- Punakaiki cavern
- Fox River cave
- Babylon
- Metro
- Honeycomb Hill
- Other (*please name*) \_\_\_\_\_

\*\* Please refer to **THIS** cave for the remaining questions

**Q11.** During your last cave visit did you feel you were in a **wilderness** environment?

- yes
- no

**Q12.** What images do you associate with wilderness in a cave environment?

("1" being the strongest image, and so on)

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_

**SPECIAL VALUES OF CAVES**

**Q13.** Different people think that places are special for many different reasons. Think about the **cave** you mentioned in Question 10 and the reasons why **you** think it is a special place. Below is a list of reasons why these places are valued by people. Please indicate which values you associate with the cave that are the most important to you by drawing a line between the item in the left hand column and the ranking in the right hand column.

Example ○-----○

Reasons why people might value the cave:

- |                                    |  |
|------------------------------------|--|
| historical meaning ○               |  |
| conservation values ○              | ○ 1. The is the <b>most</b> important to me        |
| cultural values ○                  |  |
| recreational opportunities ○       |  |
| economic opportunities ○           | ○ 2. The is the <b>second</b> most important to me |
| geological values ○                |  |
| educational opportunities ○        |  |
| scientific research ○              | ○ 3. The is the <b>third</b> most important to me  |
| ecological values ○                |  |
| OTHER ( <i>please specify</i> ): ○ |  |

**ENJOYMENT OF CAVES**

**Q14.** Think about the **last cave** that you visited (listed in Q10). Were there things that stand out as **adding** to your enjoyment of your visit?

No → If *no*, please go to question 15 below

Yes



If *yes*, please tell us what these things were and where each occurred (eg. 2m inside the cave).

a. The thing that added most to my enjoyment was: \_\_\_\_\_

Where did it occur? \_\_\_\_\_

b. Another thing that added to my enjoyment was: \_\_\_\_\_

Where did it occur? \_\_\_\_\_

c. Will the things that added to your enjoyment affect your use of this site in future? (*please tick*)

no

yes – I would come here more often

other (*please specify*): \_\_\_\_\_

**Q16.** Were there things that stand out as **detracting from** your enjoyment of your visit to this cave?

No → If *no*, please go to question 17 below

Yes



If *yes*, please tell us what these things were and where each occurred (eg. 2m inside the cave).

a. The thing that detracted most from my enjoyment was: \_\_\_\_\_

Where did it occur? \_\_\_\_\_

b. Another thing that detracted from my enjoyment was: \_\_\_\_\_

Where did it occur? \_\_\_\_\_

c. Will the things that detracted from your enjoyment affect your use of this site in future? (*please tick*)

no

yes – I would not return here again

yes – I would not come here as often

yes – I would go somewhere else for a similar experience (to see other caves, for walking etc)

other (*please specify*): \_\_\_\_\_



**Q18. Overall, how would you rate your visit to the cave? (Please circle)**

1.....2.....3.....4.....5.....6.....7.....8.....9.....10  
poor fair good very good excellent

**This is the end the survey. Please hand the survey in to the person who gave it to you.  
Thank you very much for your time. We hope you enjoy the rest of your visit to the West Coast!**

**ANY OTHER COMMENTS? Please write them here. These comments will be passed on  
to the Department of Conservation.**



## **Appendix 3. Questions for Stakeholder Interviews**

### **▪ Questions about Pancake Rocks (Dolomite Point)**

1. What are the main issues and concerns about the Pancake Rocks site?
2. For what reason(s) do you value the Pancake Rocks site the most?
3. Are there any land use or access use issues surrounding the Pancake Rocks site?
4. Are there any existing or potential non-conforming uses of the Pancake Rocks site?
5. Is demand for use of the site increasing, decreasing or staying about the same?
6. One of the objectives of the research project is to develop a list of appropriate and measurable indicators of environmental change resulting from use of these sites. What do you think are some of the key indicators that should be measured at the Pancake Rocks site?

### **▪ Questions about caves in the Paparoa National Park (in particular the Fox River Caves and Punakaiki Cavern)**

1. What are the main issues and concerns about the caves?
2. For what reason(s) do you value the caves the most?
3. Are there any land use or access use issues surrounding the caves?
4. Are there any existing or potential non-conforming uses of the caves?
5. Is demand for use of the caves increasing, decreasing or staying about the same?
6. One of the objectives of the research project is to develop a list of appropriate and measurable indicators of environmental change resulting from use of these sites. What do you think are some of the key indicators that should be measured at the caves?

### **▪ Questions about the Westland Petrel Colony (both the DoC site and the privately-owned Paparoa Nature Tours operation)**

1. What are the main issues and concerns about the petrel colony?
2. For what reason(s) do you value the petrel colony the most?
3. Are there any land use or access use issues surrounding the petrel colony?
4. Are there any existing or potential non-conforming uses of the petrel colony site?

5. Is demand for visits to the petrel colony site increasing, decreasing or staying about the same?
6. One of the objectives of the research project is to develop a list of appropriate and measurable indicators of environmental change resulting from use of these sites. What do you think are some of the key indicators that should be measured at the petrel colony site?



## Appendix 4. Pancake Rocks Visitor Profile

### Pancake Rocks Visitor Profile

A total of 329 visitors to the Pancake Rocks completed the visitor survey.

Who were they?

#### Country of Respondents' Normal Residence

Country	Frequency	Percent
New Zealand	109	33.1
United Kingdom	63	19.1
Germany	39	11.9
Australia	25	7.6
United States of America	25	7.6
Switzerland	14	4.3
Holland	9	2.7
Other European Countries	25	7.6
Other Countries	14	4.3
Missing	6	1.8
<b>Total</b>	<b>329</b>	<b>100</b>

#### New Zealanders' Normal Place of Residence

City/Town	Frequency	Percent
Auckland	15	13.3
Christchurch	16	14.2
Hamilton	4	3.5
Nelson	6	5.3
Other North Island	21	18.6
Other South Island	28	24.8
Palmerston North	4	3.5
Wellington	11	9.7
Missing	8	7.1
<b>Total</b>	<b>113</b>	<b>100.0</b>

Group Type

Who They Visited the Site With	Frequency	Percent
Visiting Alone	31	9.4
Partner/Spouse	130	39.5
Friends	37	11.2
Family	71	21.6
Friends, Partner/Spouse	31	9.4
Friends and Family	9	2.7
Business Associates	1	.3
Special Interest Group	7	2.1
Other	3	.9
Missing	9	.7
<b>Total</b>	<b>329</b>	<b>99.8</b>

Gender

	Frequency	Percent
Male	159	48.3
Female	164	49.8
Missing	6	1.8
<b>Total</b>	<b>329</b>	<b>99.9</b>

Age Groups

Group	Frequency	Percent
15-19	6	1.8
20-24	30	9.1
25-29	54	16.4
30-34	44	13.4
35-39	29	8.8
40-44	30	9.1
45-49	23	7.0
50-54	31	9.4
55-59	22	6.7
60-64	30	9.1
65-69	13	4.0
70+	13	4.0
Missing	4	1.2
<b>Total</b>	<b>329</b>	<b>100</b>

### How Did They Travel on the West Coast

Method of Transport	Frequency	Percent
Car or Van	217	65.9
Campervan	39	11.9
Bus	38	11.6
Missing	25	7.6
Other	10	3.0
<b>Total</b>	<b>329</b>	<b>100</b>

### Previous Experience of the Pancake Rocks

Have you visited the Pancake Rocks before today?

	Frequency	Percent
No	230	69.9
Yes	91	27.7
Missing	8	2.4
<b>Total</b>	<b>329</b>	<b>100</b>

If yes, how often do you visit the Pancake Rocks?

	Frequency	Percent
Once a month or more	3	3.7
About once a year	8	9.9
Once every few years	30	37.0
Occasionally in my lifetime	45	55.6
Missing	5	6.2
<b>Total</b>	<b>91</b>	<b>112.4</b>



## Appendix 5. Fox River Caves Visitor Profile

Who Were They?

Country of Respondents' Normal Residence

Country	Frequency	Percent
Australia	3	10.0
Canada	4	13.3
Ireland	3	10.0
New Zealand	8	26.7
Switzerland	1	3.3
The Netherlands	1	3.3
United Kingdom	8	26.7
United States of America	2	6.7
<b>Total</b>	<b>30</b>	<b>100</b>

New Zealanders' Normal Place of Residence

City/Town	Frequency
Auckland	1
Christchurch	3
Greymouth	1
Oxford	1
Tasman	2
<b>Total</b>	<b>8</b>

Group Type

Who They Visited the Site With	Frequency	Percent
Family	3	10.0
Friends	6	20.0
Friends and Family	2	6.6
Partner/Spouse	8	26.7
Tour Group	8	26.7
Visiting Alone	3	10.0
<b>Total</b>	<b>30</b>	<b>100</b>

Gender

	Frequency	Percent
Male	17	52
Female	16	48
<b>Total</b>	<b>33</b>	<b>100</b>

## Age Groups

Group	Frequency	Percent
15-19	2	6.7
20-24	3	10.0
25-29	7	23.3
30-34	7	23.3
35-39	3	10.0
40-44	1	3.3
45-49	3	10.0
50-54	1	3.3
55-59	1	3.3
60-64	1	3.3
65-69	1	3.3
<b>Total</b>	<b>30</b>	<b>99.8</b>

## How Did They Travel on the West Coast

Method of Transport	Frequency	Percent
Car	20	60.6
Mini-van (tour group)	8	24.2
Other	5	15.2
<b>Total</b>	<b>33</b>	<b>100</b>

## Previous Experience of Caves

Have you ever visited a cave before today?

	Frequency	Percent
No	29	87.9
Yes	4	12.1
<b>Total</b>	<b>33</b>	<b>100</b>

If yes, how many times have you visited caves before?

	Frequency	Percent
Once	1	3.4
A few in my lifetime	27	93.1
At least once a year	1	3.4
<b>Total</b>	<b>29</b>	<b>99.9</b>