

Social impact issues among visitors to Franz Josef Glacier, Westland National Park

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Abstract

A quantitative survey of 413 visitors to Franz Josef Glacier was undertaken to explore crowding and conflict issues at this high-use, front-country site. Specifically, the research investigated crowding and conflict as it occurred between and within guided and non-guided visitors. The research was carried out in response to increasing interest in providing guiding services on the glacier, and the Department of Conservation's expressed need to understand more about crowding and other social issues at high-use sites for which it is responsible. Results from the survey suggest there are no significant differences between guided and non-guided visitors in terms of their demographics, evaluation of visit, and perception of impacts. For both sample groups, the results indicate generally low to moderate levels of crowding, and no significant relationship between the number of visitors and reported levels of crowding. Crowding was concentrated at the front of the glacier (for guided visitors) and on a narrow temporary track, half way to the glacier (for non-guided visitors). While reasonable tolerance was demonstrated towards other potential sources of impact, approximately one fifth of guided and non-guided respondents mentioned some degree of concern over seeing large groups and hearing aircraft noise and, for non-guided visitors, the location and use of a safety barrier located in front of the glacier. Unprompted comments also indicate that both guided and non-guided visitors would not like to see the glacier valley much 'busier' than it is now. Although low to moderate levels of crowding and conflict were reported, it is recommended that a shortened version of the survey be used to monitor these issues over the next three years.

Keywords: crowding, social issues, guided walks, scenic flights, visitor impact, natural hazards, Franz Josef Glacier, New Zealand

1. Introduction

1.1 BACKGROUND

This report presents the results of an investigation into social impact issues among visitors to Franz Josef Glacier, Westland National Park. The investigation was commissioned by the Department of Conservation (DOC) in response to three agendas:

- National priorities for social science research
- Increasing commercial interest in guided services on the Franz Josef Glacier
- Review of the Westland National Park Management Plan

The first agenda relates to DOC's priorities for social science research. These priorities were established following a successful workshop on the recreation experiences of visitors to protected areas, in June 1998 (Cessford 1999a). One of the workshop's findings was that the situation at Franz Josef Glacier provided a good case study for exploring social impact issues between public and commercial recreation.¹

The second agenda relates to the local situation at Franz Josef where two private companies are licensed to run guided trips on the Franz Josef Glacier. Up until 1998, only one company had been licensed to do so. This situation raised concern from one of the guiding companies and local DOC managers over visitor safety, perceived crowding by guided clients, and potential conflicts between guided and non-guided visitors. DOC managers were also concerned about how any future applications for a guiding concession on Franz Josef Glacier could be managed, given that visitor perceptions of crowding and other potential conflicts on the Glacier are not completely understood.

The third agenda stems from the review of the current Westland National Park Management Plan. A new plan is in preparation and new policies are being prepared for the management of visitors to Franz Josef and Fox Glaciers. The results of this research project may be used in the process of formulating and monitoring the implementation of those policies.

1.2 OVERVIEW AND DISCUSSION ON THE MANAGEMENT OF VISITORS

It is important to consider the wider recreational and tourism context within which this study was undertaken. Both Franz Josef and Fox Glaciers have been described as the 'engine room' of tourism on the West Coast of the South Island (Tourism Resource Consultants 1995). With around 250,000 visitors per annum, both glaciers provide significant benefits to the local and regional economy.

¹ Other social science research priorities are identified in the workshop reports (Cessford 1999b).

The key features of the local tourism industry that are based partly or solely on the glaciers include:

- Helicopter and fixed-wing scenic flights
- Heli-hiking
- Guided half-day and full-day hikes on both glaciers
- Guided ice climbing
- Guided walks to (but not on) the Franz Josef Glacier

While only one guiding company operates on the Fox Glacier, two companies now operate on the Franz Josef Glacier.

Both the Fox and Franz Josef Glacier valleys are dynamic landforms and a visit is heavily dependent on not only the condition of the glacier and river valley, but also the weather. Safety barriers are used at both glaciers to encourage non-guided visitors not to venture onto the ice. Visitors are advised to go on a guided trek if they wish to walk on the glacier. Perceptions of crowding on guided glacier walks can be influenced, to a large degree, by the physical condition of the glacier and the competency of the guide (Mark Mellsop, Franz Josef Glacier Guides, pers. comm. 8 June 2000).

There are significant natural hazards that non-guided visitors are urged to be conscious of (via signs and park information brochures). The hazards include rock-fall, sudden changes in the glacier's outflow, and ice collapse from the terminal face of the glacier.

Previous research in both valleys has focused on three key issues that are faced by both DOC managers and the guiding companies. These include management of the natural hazards (Espiner 1999), perceived crowding and the effects of aircraft noise (Oliver 1995; Sutton 1998). In summary, the research suggests that:

- The level of hazard awareness among visitors is only modest.
- Getting close to the glacier and touching the ice are important reasons why visitors come to the valleys.
- Visitors to the valley sides are more sensitive to potential crowding and the effects of aircraft noise.
- Crowding has been reported only during the heaviest periods of visitation in the main valleys (normally between December-February).

Crowding, as perceived by guided clients, and the relationship between guided and non-guided visitors, was not investigated to any great extent by previous studies. This study builds on the work of Oliver (1995), Sutton (1998), and Espiner (1999), by focusing on the relationships within and between guided and non-guided visitors.

1.3 OBJECTIVES

The key objective of this investigation was to identify any important social impact issues among guided and non-guided visitors to Franz Josef Glacier. A secondary objective was to develop a survey format that could be repeated by local DOC staff, if required, to monitor the social issues at the Glacier over subsequent years.

2. Methods

2.1 SURVEY APPROACH

The research was undertaken using a quantitative survey questionnaire, which included a combination of open and closed questions (refer Appendix 1). The survey population included all visitors (guided and non-guided) walking to the Franz Josef Glacier.

2.2 SAMPLE FRAMEWORK, LOCATION, AND TIMING

Two sub-populations were identified for the survey: guided and non-guided visitors. Proportionately, there are more non-guided than guided visitors to Franz Josef Glacier. Data on the exact proportion of each were not available at the time of this study, although DOC's track counter records suggest that the *total* number of visitors to the Franz Josef Glacier is in the order of 250,000 per annum (DOC, Franz Josef Visitor Statistics 1999–2000).

A draft questionnaire was pilot-tested on 30 guided and non-guided visitors before the survey commenced. Using a re-drafted questionnaire, a total of 413 responses were obtained between 21 February and 1 March 2000. This included 273 non-guided and 140 guided responses. Questionnaires were administered in two ways. Non-guided visitors were interviewed on their way back to the car park (see Fig. 1), while guided visitors completed their questionnaires either on the bus on the way back to Franz Josef township or in the guiding company offices, after their return from the glacier. The field researcher distributed the questionnaire to the guided clients on the bus and in the offices and stayed with the group until the questionnaires were completed.

Respondents were selected on a 'next to come' basis. Only individuals completed the questionnaire. Gender bias was minimised by using the 'person with the next birthday' method to select the respondent.

2.3 LIMITATIONS

Three sampling constraints are worth noting. First, the investigation was carried out deliberately during one of the busiest months of the summer season.² The assumption was that it would provide the best opportunity to explore potential sources of conflict. Results would, therefore, relate to 'worst possible scenarios'. Whilst visitor numbers during the survey period were

² The 'busy season' is typically January–March, with early–mid January as the peak period. January is characterised by a higher proportion of New Zealand visitors than in other months. Demand for half-day glacier walks is highest in January.

described by both the guiding companies and DOC as being high, because it was February, many New Zealand visitors were missing from the sample. The results, therefore, are not indicative of year-round use.

Second, the investigation of social impact issues in the outdoors via quantitative methods often means there is limited time to explore visitors' deeper feelings or perceptions. Visitor impact perceptions can differ over time, therefore, surveys carried out immediately after or during a visit reflect the fact that visitors have had limited time to think about or reflect on their experiences. Visitors may not consider what constitutes an issue or impact until they are asked (Moore 1995). In response to this phenomenon and the limitations of asking closed questions, all unprompted comments made by respondents were recorded and analysed, and are presented in Appendix 3.

Third, the survey was carried out following a change in access to the Franz Josef Glacier. Under 'normal' conditions, access is via a walking track that follows the riverbed to the terminal face of the glacier. A major storm in November 1999

resulted in part of the track being re-routed across the base of a lateral moraine for a distance of about 400 m. The increased difficulty of this track and the hazard messages conveyed by DOC's warning signs resulted in some visitors turning around at the start of the detour and returning to the car park. Further to this, the rope safety barriers had been relocated from about 50 m, to a position approximately 100 m from the glacier face.



Figure 1. The area of the Franz Josef Glacier, south Westland, which is the location for this survey. The visitor-barriers referred to in the text are indicated.

3. Results

3.1 CHARACTERISTICS OF THE SAMPLE

3.1.1 Country of origin

Country of origin does not appear to be a strong factor influencing whether people choose to walk guided or non-guided on the glacier. Visitors from New Zealand, Australia, UK, US, and Germany tended to dominate both guided and non-guided samples (Fig. 2). Of the visitors from New Zealand, Australia, US, and Germany, more preferred the non-guided to the guided option. Of the visitors from the UK, Denmark, Israel, Sweden, Ireland, Korea, Japan, and Czechoslovakia, more preferred to be guided than non-guided.

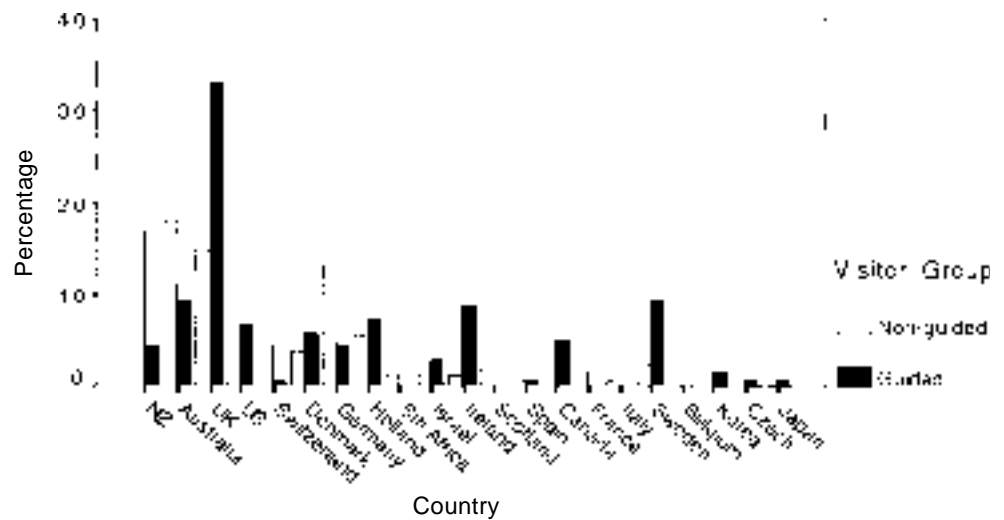


Figure 2. Origin of visitors by region and major country.

3.1.2 Age

Guided visitors comprised mostly 20–24 years olds (about 31%), 25–29 year olds (just under 30%) and 30–34 year olds (nearly 14%) (Fig. 3). Fewer visitors from these age groups chose the non-guided option. Interestingly, there were more

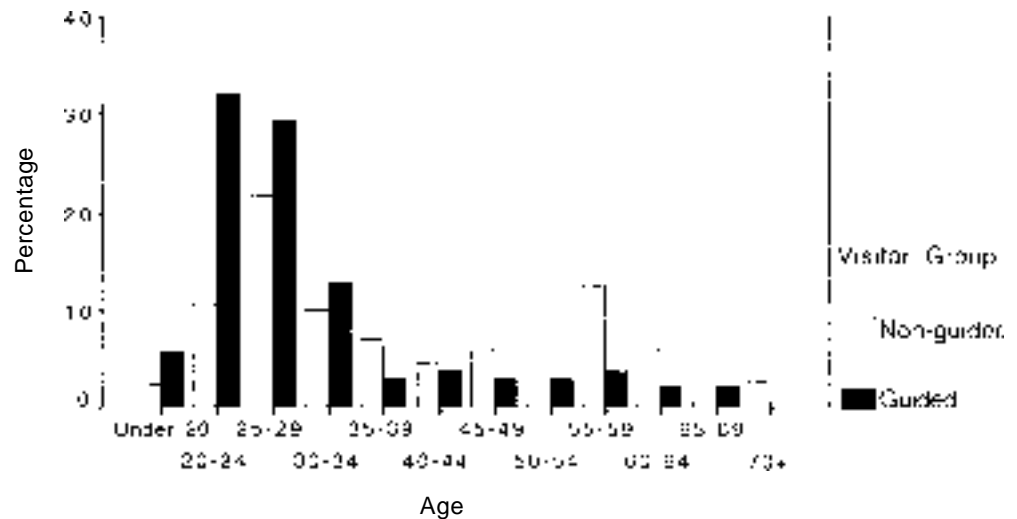


Figure 3. Age groups of guided and non-guided visitors.

people from the older age groups (45 years or older) who were non-guided than those who chose the guided option. This can be explained in that the guided glacier walk is more suited to young and fit people whilst the walk to view the glacier does not normally require the services of a guide.

3.1.3 Gender

The mix of male and female respondents was reasonably even at 52% and 48% respectively.

3.1.4 Group size

The average group size for half-day and full-day guided trips is around 10 visitors to one guide. It is quite common during January–March that guided groups of up to 40 at a time (four groups of 10 with four guides) will approach the glacier. Once on the glacier, the group is normally separated into smaller groups of around 10 visitors per guide. The individual guided respondent was not asked how many others they were travelling with. From observation and from conversation with the guiding companies, most guided visitors were travelling in groups of less than four (although bus groups such as the Kiwi Experience are not uncommon). However, once on a glacier trek, most visitors are put into groups of 10–15 per guide. It was considered that this group size is more pertinent to the experience on the day, rather than the number of other travelling companions that may have joined or waited for the individual who went on the glacier walk. The group sizes for non-guided visitors are illustrated in Fig. 4.

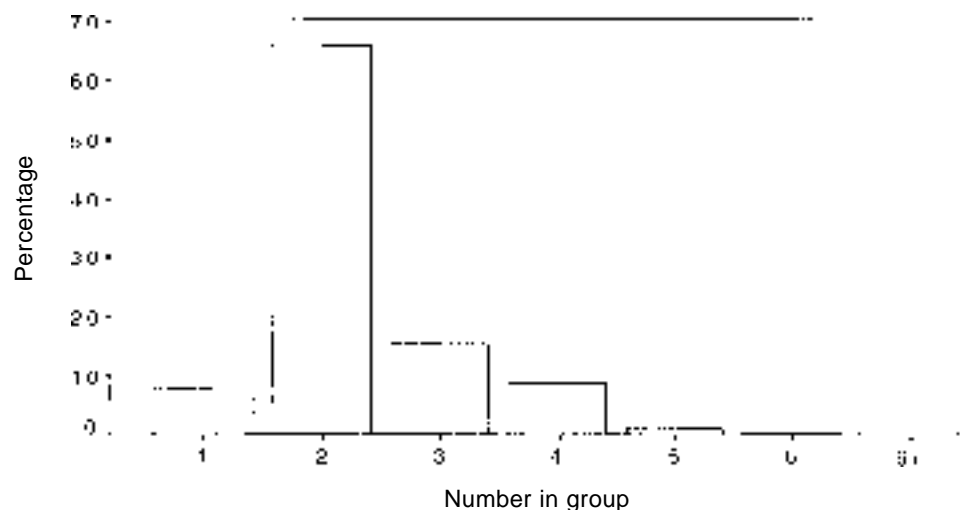


Figure 4. Group sizes for non-guided visitors.

Consistent with other national park studies, Fig. 4 illustrates that the size of non-guided groups is typically two (66%), three (15%), or four (9%) people. The mean group size of this sample was 2.6. An exception in this case was a bus tour of 27 that was encountered part way through the survey period (shown as 6+ in Fig. 4). Other large organised tour groups were excluded from the sample as they were on tight time schedules and, in general, did not have time to stop and answer questions. Large bus groups are reasonably common in both the Franz Josef and Fox Glacier Valleys.

3.2 CHARACTERISTICS OF THE VISIT

3.2.1 Previous visits

Typically with other popular natural attractions in New Zealand and overseas, most respondents were on their first visit. Ninety-five percent of guided and 81% of non-guided visitors were on their first visits (Fig. 5). Three percent of guided and 14% of non-guided visitors had been once before. Very few others had more experience here.

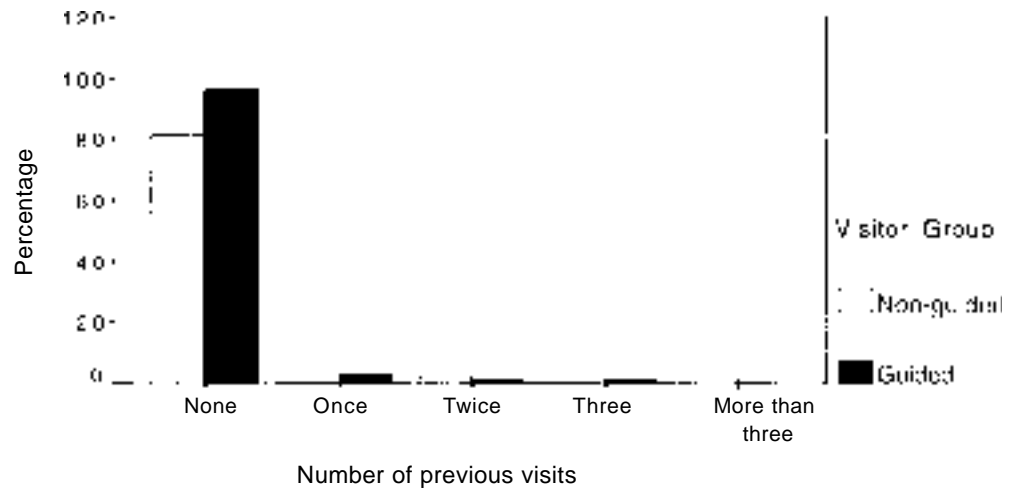


Figure 5. Previous visits to Franz Josef Glacier.

The high proportion of first time visitors also has a bearing on the perceived level of crowding (refer section 3.4.1). This phenomenon has been cited extensively in previous research as the 'Last Settler Syndrome' (Moore 1995). Those visitors with little or no previous experience of a natural location will often report low levels of crowding, as they do not know what conditions were like in the past.

3.2.2 Visit to Fox Glacier

Non-guided visitors are far more likely to make visits to both glaciers than guided visitors (Fig. 6).

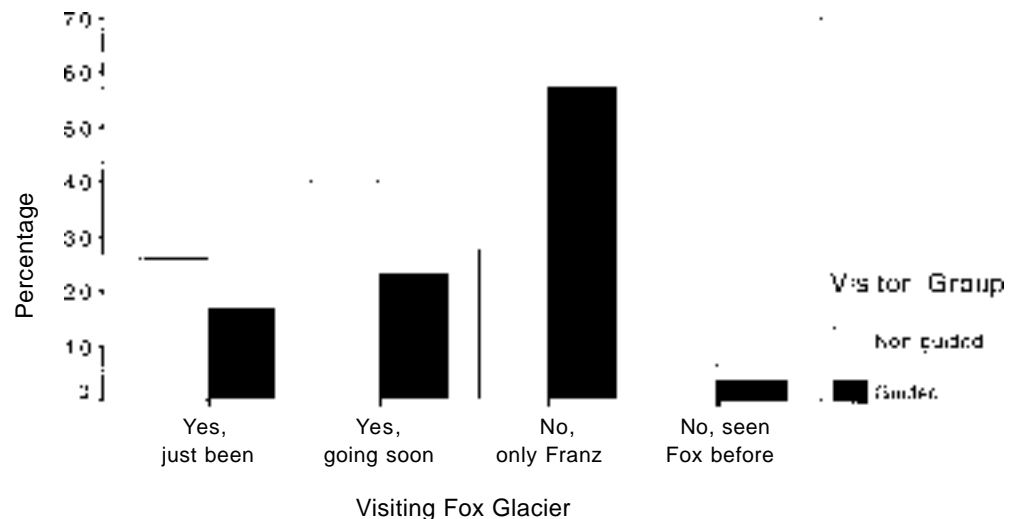


Figure 6. Inclusion of a visit to Fox Glacier.

Guided visitors appear more selective about which glacier to go to, with 57% visiting Franz Josef Glacier only. This compares to 28% of non-guided visitors who mentioned they were only visiting Franz Josef Glacier. Thirty-nine percent of guided clients either had just been or were going to Fox Glacier (it is unknown if they went on a guided tour at Fox Glacier). By contrast, 66% of non-guided visitors either had just been or were going to Fox Glacier.

3.2.3 Length of visit to Franz Josef Glacier

Only non-guided visitors were asked in the questionnaire about their length of visit. Guided visits are more structured with 50% of clients surveyed here on half-day hikes, 47% on full-day hikes and only 3% on a heli-hike. The proportion of those undertaking heli-hikes is larger than that included in this sample as the research focus here was more on valley walking visitors. Both guiding companies report that heli-hikes are becoming increasingly popular. Discussions with both guiding companies suggested that half-day excursions are more in demand during January (from New Zealand and Australian families), whereas in February and March, the young adventurers/backpackers lead to greater demand for full day trips.

Figure 7 illustrates that the most commonly reported duration for a non-guided visit to the glacier is around one hour (38%). Visits lasting between 1.5 hours (24%) and two hours (20%) were also common. When combined, these results indicate that around 82% of non-guided visitors spend up to two hours on a visit to the glacier. Those who take up to 30 minutes do not get as far as the glacier terminal (8%) and turn around near to where the track has been re-routed through the lateral moraine. It was observed that those taking longer than 2.5 hours, often walked to and from Franz Josef township.

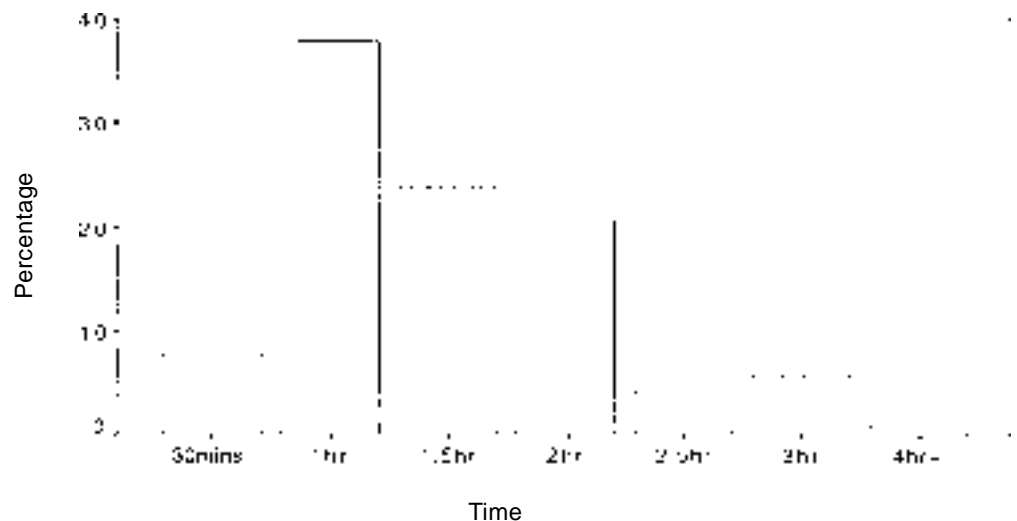


Figure 7. Length of time for visit to glacier (non-guided).

Use of the valley tends to peak at mid-late morning, early afternoon, and again in the late afternoon-early evening. Guided trips run throughout the day between approximately 10 am and 6 pm. A small number of respondents mentioned that they arrived early to 'avoid the crowds'.

Use increased later in the afternoon, and although survey work stopped around 6 pm each day, visitors were still arriving at the car park.

3.2.4 Reaction to safety barrier

As mentioned above, a safety barrier is installed about 80–100 m in front of the terminal face of the glacier to encourage non-guided visitors not to proceed. By far the majority of non-guided visitors (69%) reported that they did not go over the rope barrier, while 31% mentioned they did. This corresponds with Espiner (1998) who found that approximately 60% of visitors to both Franz and Fox Glaciers complied with the safety barriers and hazard warning signs while the remaining 40% ignored warnings and crossed the barriers. Unprompted comments from those who did go over the barrier during this survey showed that some of these visitors rationalised their behaviour by the behaviour of others:

- *Followed the guided group under the ropes as they looked like they knew what they were doing ...*
- *Think the signs are unnecessary, but saw some people go under the ropes so we did ...*

Those who did not go over the barrier, rationalised their behaviour also on the actions of others:

- *We watched the people who went under the ropes flee when the ice fell down ...*
- *Would like to get closer, why stop us at 200 m? Seems unfair that guided groups go past ...*

While most visitors comply with the hazard warning signs and rope barrier, around a third of all non-guided visitors did not, and it maybe that they are motivated more by the experience of touching or getting close to the glacier than their perceptions of the risks involved.

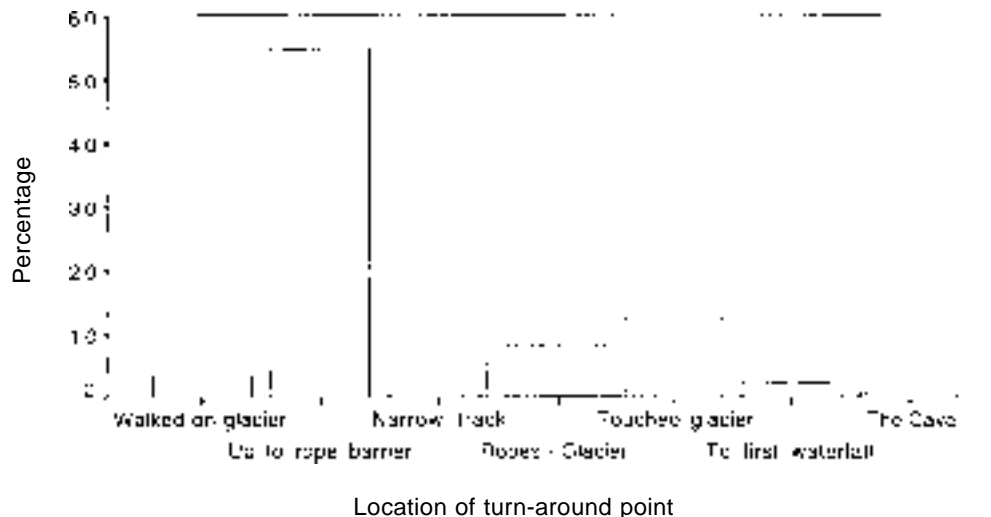
A Chi-Square test was used to explore the relationship between the number of previous visits and response to the rope barrier. The assumption being that visitors on their first and only visit to the glacier, maybe more inclined to cross over the barrier than those visitors who had the opportunity to return. The test showed no significant relationship between the two variables.

3.2.5 Turn-around points

Both non-guided and guided visitors were asked about how far they went on or to the glacier. The main focus of this question was to determine what proportion of non-guided visitors actually reached the safety barrier in front of the glacier (Fig. 8). Many visitors did not travel far on their visit with 19% turning around at the narrow temporary section of track (see Fig. 1).

Comments from these respondents suggested that the narrow track appeared too difficult and the possibility of rock-fall (as shown on signs) seemed to put people off going further. Of those 81% who continued, most went no further than the rope barriers (55%), a further 8% went between the barrier and the glacier, 13% touched the glacier, 3% said they walked on the glacier. Less than 1% went to the ice formation at the terminal of the glacier, referred to as 'The Cave'.

Figure 8. Turn-around points for non-guided visitors.



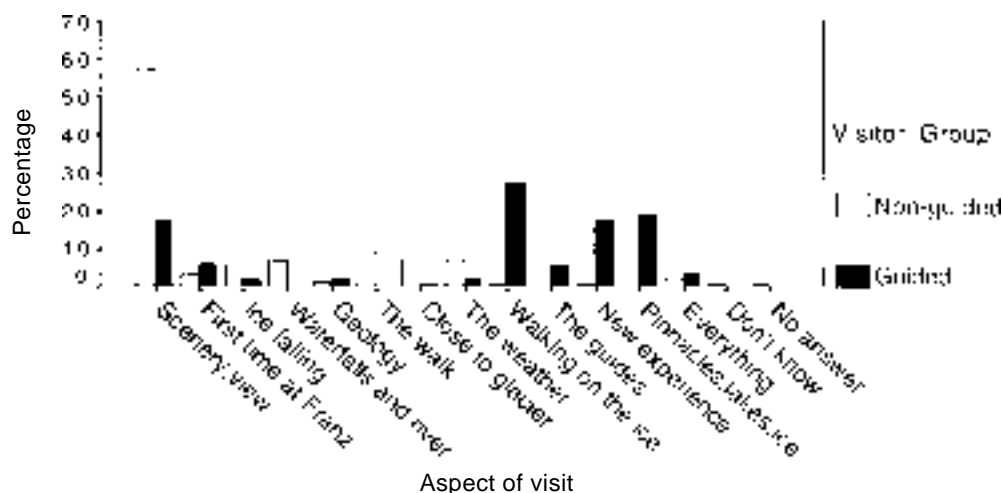
3.3 VISIT EVALUATION

3.3.1 Best aspects of the visit

Non-guided visitors

Scenery (57%), the walk (9%), getting close to the glacier (7%), seeing the ice falling (5%) and the presence of waterfalls and a fast flowing river (7%) were the most commonly reported ‘best aspects’ of the visit. Figure 9 shows that getting close to the glacier did not rank as highly as was expected, given that around one-third of this sample crossed the rope barrier to get closer to the glacier.

Figure 9. Aspect of the visit that was liked best.



Guided visitors

In contrast to non-guided visitors, scenery (17%) was reported less than the activity of walking on the glacier itself (27%). A ‘new experience’ (17%) and the ‘Pinnacles’ (19%) were also considered as best aspects of the visit. These results do not suggest that the scenery is any less important to guided visitors, rather that their focus is very much on the glacier walk itself.

As with many other national park visitor studies, the responses to questions on ‘the best or most outstanding aspect of a visit’ will often include a range of response. These represent a mixture of what can be described as motivations (e.g. ‘new experience’), activities (e.g. walking on the glacier), or natural features (e.g. ‘waterfalls’) (Moore 1995).

3.3.2 Dislikes

Among non-guided visitors nearly 40% specifically indicated that there was nothing that was disliked. An additional 22% did not answer.

This left 38% who mentioned dislikes including not getting to the ice (8%), seeing too many people (7%), and the rough track to the glacier (7%) (Fig. 10).

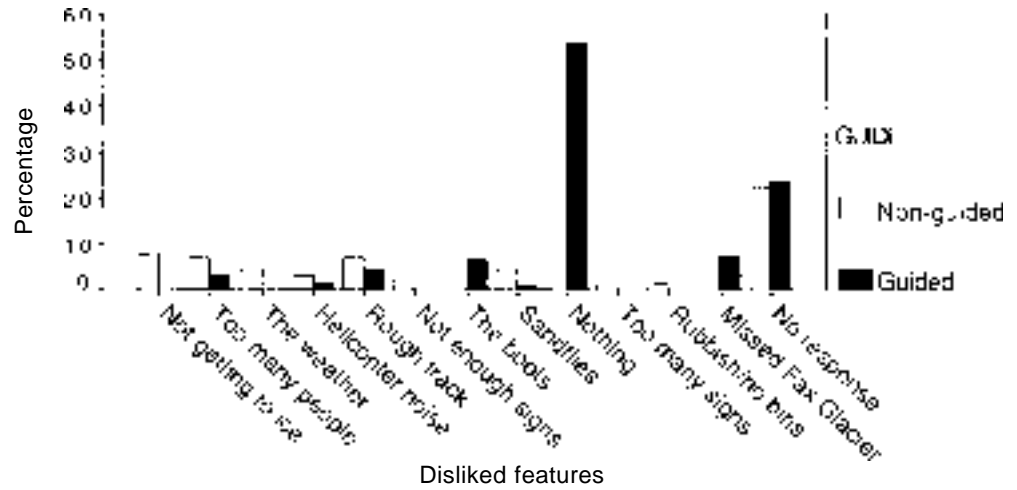


Figure 10. Aspects of the visit which were disliked.

Guided visitors had high response rates for 'nothing' being disliked (54%) and an additional 24% gave no answer. This left only 22% who indicated any dislikes such as seeing 'too many people' (3%), outfitting gear such as boots (6%), helicopter noise (1%), and the rough track (4%).

Both guided and non-guided respondents mentioned they did not take any action to change or avoid the aspects that they did not like.

3.3.3 Visitor expectations

Notably, both non-guided and guided groups reported that the visit was much better than expected (around 34% and 36% respectively). Well over a third of non-guided visitors felt their visit was as expected, whilst fewer guided visitors (around 23%) thought this. More guided visitors reported the trip was not as good as expected (6%) than non-guided visitors (2%) (Fig. 11).

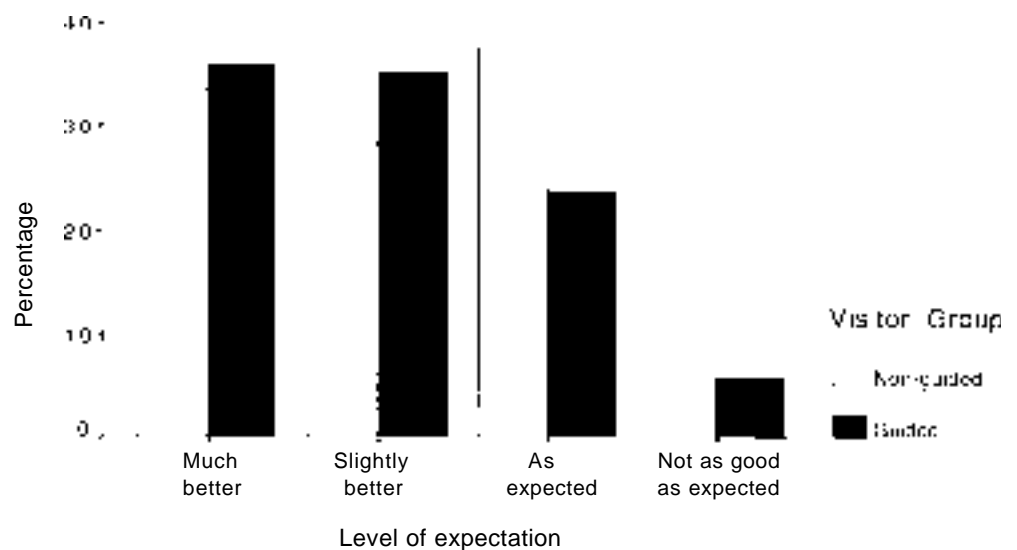


Figure 11. Overall expectations for the visit.

There is no clear explanation why a higher proportion of guided visitors felt their visit was not as good as expected. Although only 6% of guided visitors responded in this way, this may be an important margin for guiding companies to investigate.

3.4 SOCIAL IMPACTS

3.4.1 Perceptions of crowding

Overall perceptions

A standard nine-point Likert Scale was used to assess perceptions of crowding for both guided and non-guided visitors. The results show that both visitor groups are reasonably tolerant of current visitor numbers but have expressed some concern over perceived crowding (Fig. 12).

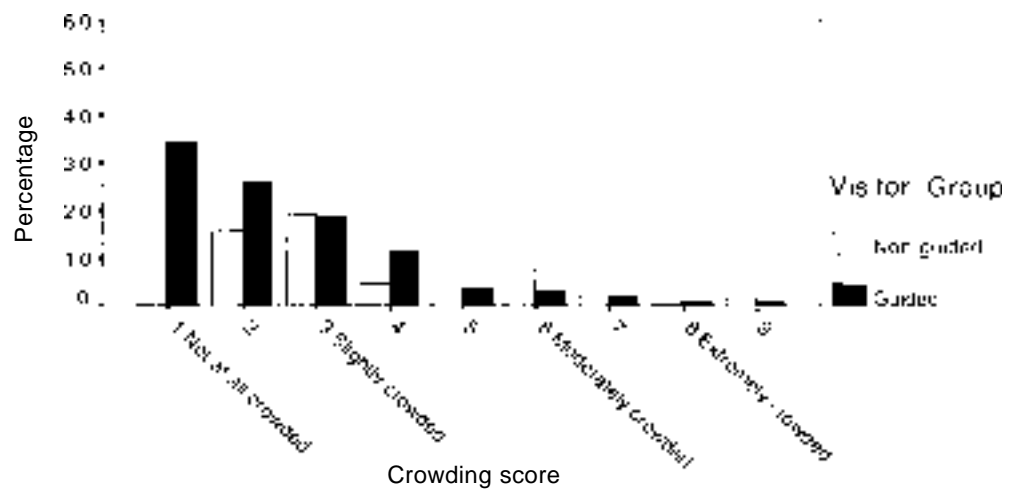


Figure 12. Perceptions of crowding.

Sixty percent of non-guided and 60% of guided visitors reported that they were 'not crowded' (scores 1-2). Degrees of crowding were reported by 37% of non-guided and 40% of guided visitors (scores 3-9).

A detailed summary of the crowding scores is presented in Appendix 2.

The mean crowding score for guided visitors (2.5) was not significantly different from the mean for non-guided visitors (2.3).

Some unprompted comments from non-guided visitors provide further insight into these results:

- *So crowded ... wanted peace and quiet, but too many people, especially the group of 60 at the ropes ...*
- *We come to an area to enjoy its scenery and fresh air and are not bothered by the crowds, ... like as many people as can to see it.*

These two comments illustrate the extremes of positive and negative comments on crowding from non-guided visitors.

Perceptions of crowding can be more actively managed with guided clients by the guides keeping group sizes small and manageable and by keeping an adequate distance from other guided group. For instance:

- *Sometimes we could see other groups while on the glacier ... but a lot of the time couldn't see anyone else so it never bothered me.*
- *Don't let it get overcrowded. I enjoy the relative uncrowded nature of the glacier.*
- *There were crowds where groups crossed over, but enough time was left between different ability groups for this not to be a problem ...*

Location of crowding

Guided and non-guided respondents who scored over 3 on the crowding scale were asked where they felt most crowded. For guided groups the main area of concern was getting on and off the glacier, where occasionally groups bunched-up. For non-guided visitors, the main locations of concern were on the narrow section of temporary track at the base of the moraine, at the rope barrier, and for some, the whole time while in the river valley.

Both the 'front of glacier' and 'on and off the glacier' (see responses for guided visitors, Fig. 13) relate to the place of waiting and the action of getting on and off the glacier. When these percentages are combined (nearly 40%), it shows that the front of the glacier is a potential 'hot spot' in terms of crowding. Around 10% of both guided and non-guided visitors felt crowded the whole time. The riverbed is also notable, where visitors tend to spread-out along and to either side of the track, giving the impression of a 'mass' of people.

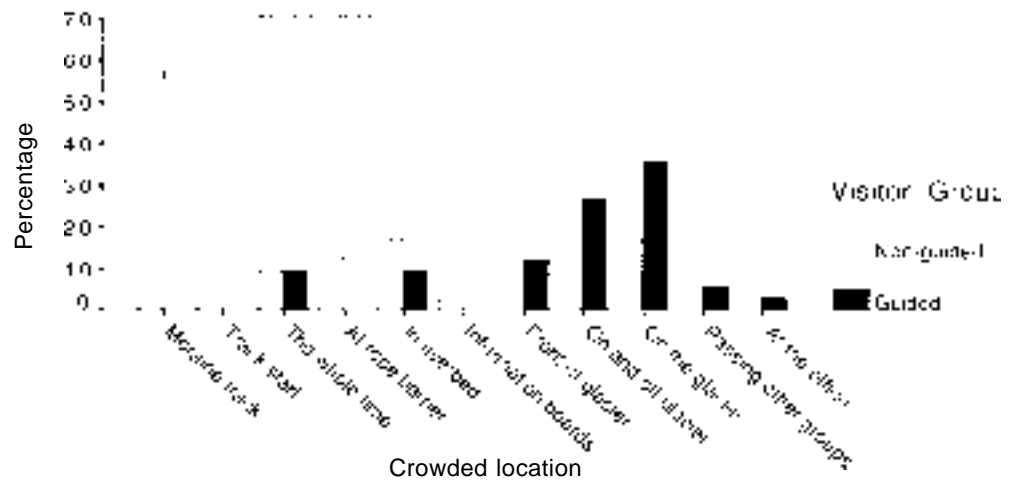


Figure 13. Section of the walk to or on the glacier where crowding was noticed.

Relationship between visitor numbers and crowding

Independent Sample T-Test were used to explore the relationship between visitor numbers and crowding scores for both guided and non-guided samples. Mean crowding scores were compared on days where the difference between the visitor numbers were greatest for both samples. The T-Test showed no significant relationship between the number of guided clients on the glacier and crowding scores (that is, increased numbers of guided clients did not correspond to an increase in crowding scores). Similarly, the results for non-guided visitors did not support any relationship between an increase in visitor numbers and an increase in crowded scores.

3.4.2 Perceptions of other social impacts

A variety of different social impact issues were raised with visitors, including the following.

Aircraft

The effects of aircraft on visitors to Franz Josef Glacier has been researched during the last five years (see Oliver 1995; Sutton 1998) and was investigated again during January 2000 using DOC's standard aircraft monitoring questionnaire. Results from DOC's aircraft monitor were not available at the time of writing this report.

Figure 14 shows that most visitors noticed but were not concerned with aircraft (53% of non-guided and 61% of guided visitors). However, around 22% of non-guided and 25% of guided visitors showed some level of concern (either slight, moderate or high).

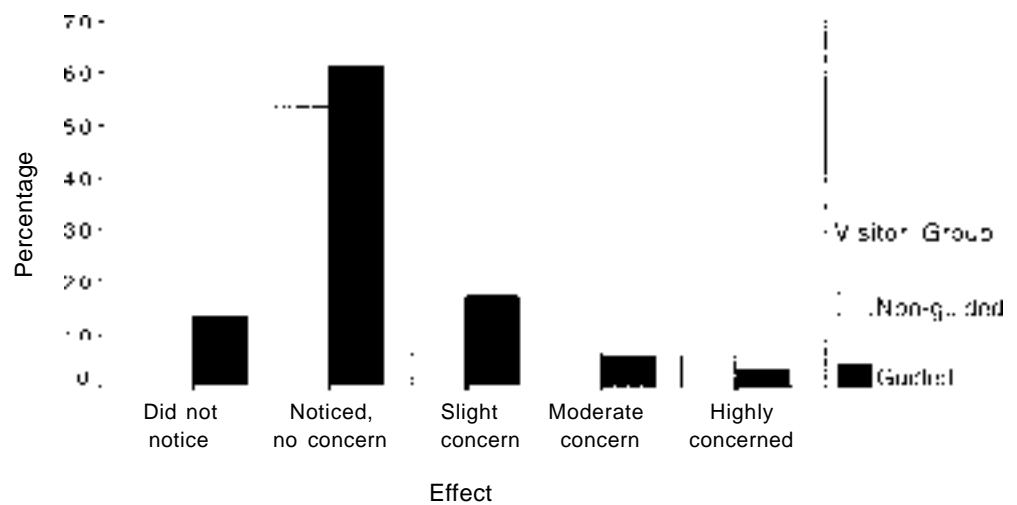


Figure 14. Response to aircraft activity.

Helicopter landings on the glacier

This question was directed specifically at guided visitors, to see what effects the heli-hike operation had on other guided clients (Fig. 15).

Nearly 77% of guided clients did not notice helicopters dropping off heli-hike clients and around 20% of those that did notice, were not concerned by them. Less than 1% each showed anything more than slight concern.

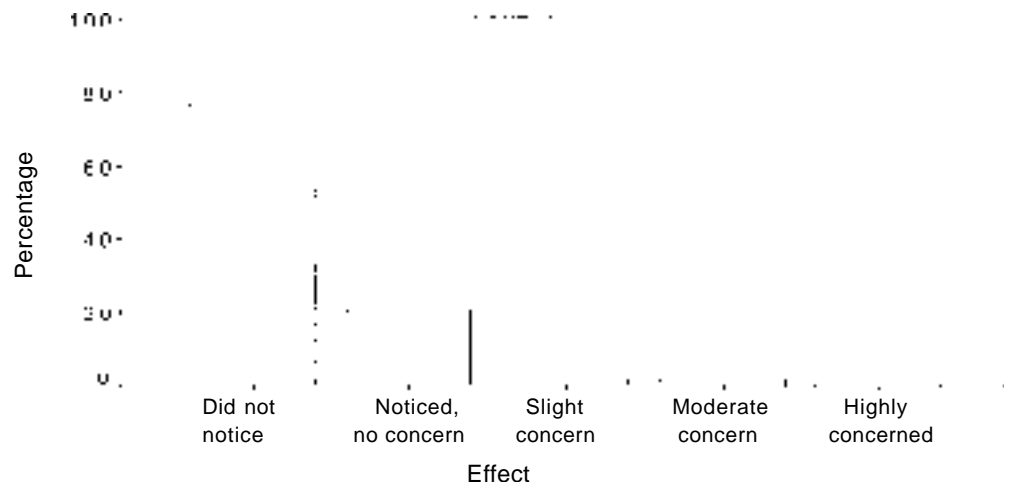


Figure 15. Response to helicopters by guided visitors.

Large groups

The term 'large' was defined by what the respondent thought was large, rather than a group size set by the researchers. Nearly 60% of both groups noticed but were not concerned with large groups (Fig. 16).

Whilst it could be concluded that both samples seem reasonably tolerant of encountering large groups, it should be noted that close to 20% of non-guided and 21% of guided visitors expressed some concern. It seems reasonable to expect that guided respondents may be more tolerant of large groups, given that many guided groups, on average, number around 10 visitors.

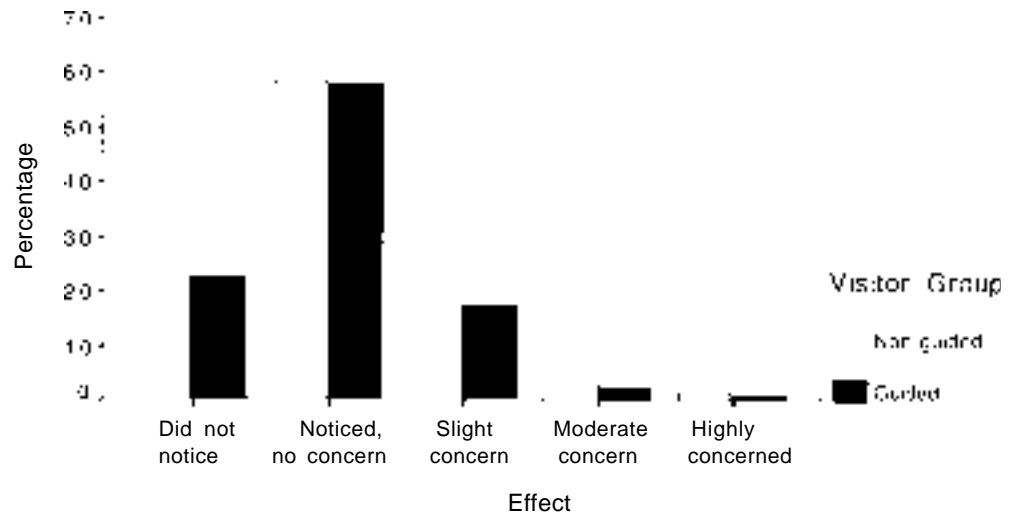


Figure 16. Response to seeing large groups.

However, 17% of guided clients reported slight concern over seeing other large groups in the valley. Some comments from non-guided visitors were clearly directed towards guided groups:

- *The guided groups we saw were too large.* (This is understandable as guided groups travel together enroute to and from the glacier.)
- *Think there should be a definite limit on the number of guided groups*
- *Think the guided groups are big business ... Don't like all the flying done over the glacier ... I think it is not necessary*

There were no unprompted comments from guided clients about non-guided groups.

Visitors going over the safety barrier

Non-guided visitors either did not notice other people (non-guided) going over the barrier (36%) or when noticed, did not concern them (47%). Seeing guided groups go over the barrier had similar results with 50% of the sample not noticing or not being concerned (41%).

Figure 17 presents the results for this question and interestingly, 17% of respondents mentioned some degree of concern (combined percentages for slight, moderate, and high levels of concern). Informal comments from those 'highly concerned' respondents, were centred on the fact that other people were putting themselves at risk and hence the concern was for the safety of others.

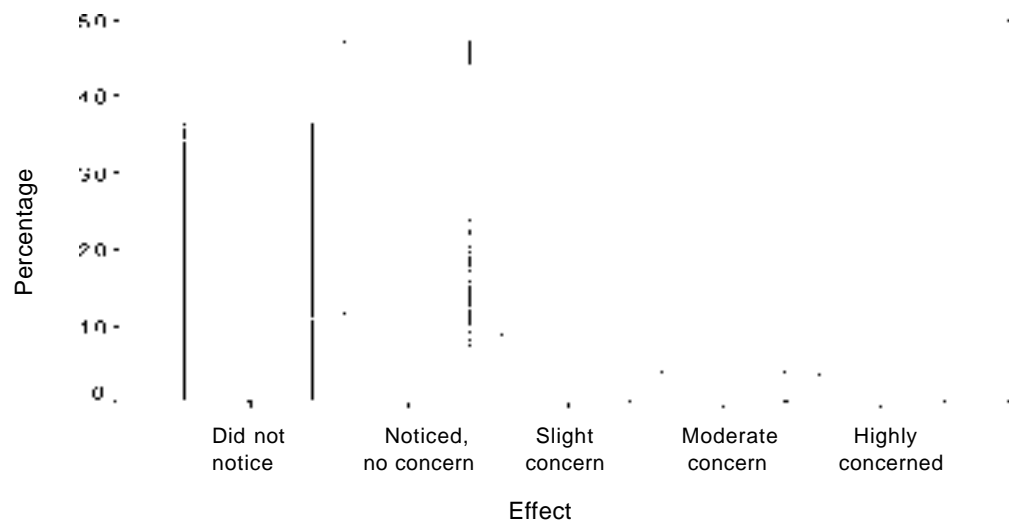


Figure 17. Response to seeing others go over the barriers.

Safety barriers preventing non-guided access to the glacier

Figure 18 indicates that non-guided visitors had no major concern over the safety barrier and its purpose (63%). An additional 18% did not notice the barrier. Only one-fifth (19%) showed either slight, moderate, or high levels of concern.

Some comments are worth noting from those who were either moderately or highly concerned with the presence of a safety barrier:

- *If known you couldn't get closer than 300 m to glacier, would not have bothered*
- *Would like to get closer to the glacier*
- *Does not seem right that people go past the barriers, should have sign that reads 'at own risk'*

There seems some sense in reviewing the information provided for visitors to clarify just how close they can expect to get to the glacier.

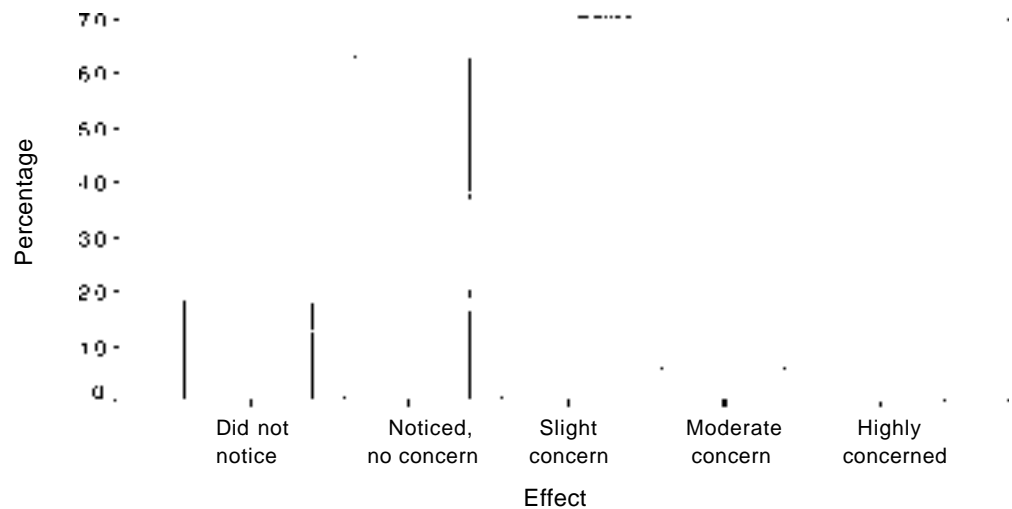


Figure 18. Response to having a safety barrier.

Other guided groups on the glacier

Figure 19 illustrates that the vast majority of guided groups notice other groups on the glacier but it does not concern them to any great extent (76%). Around 16% of guided clients did not notice other guided groups while on the glacier.

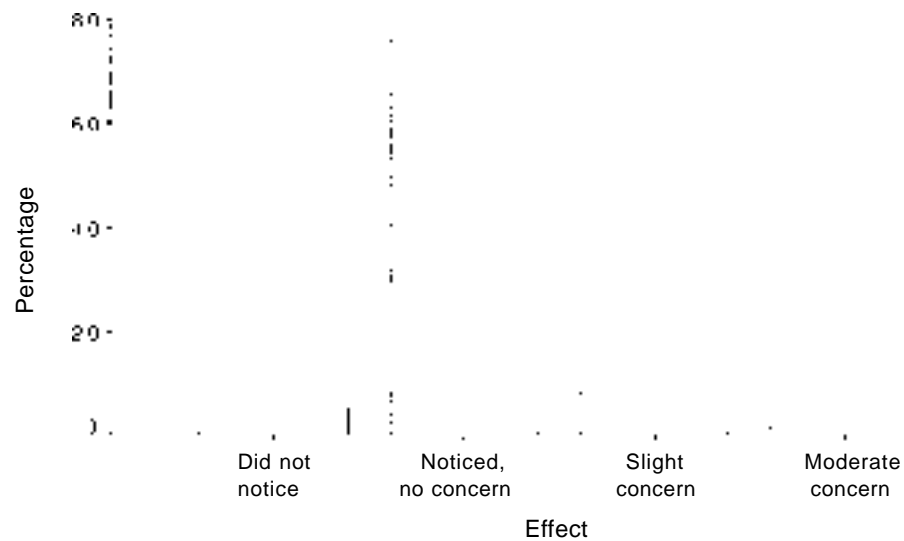


Figure 19. Response to seeing other guided groups on the glacier.

Nearly 8% reported slight concern and less than 2% moderate concern (it is unclear if this is due to perceived crowding or other issues such as safety).

Other sources of inter-group impact perceptions

The questionnaire also explored guided and non-guided visitor reactions towards seeing rubbish, clothing, and equipment left by guided and non-guided groups, and seeing groups all wearing the same clothing and equipment. Results for these variables were not notable. In terms of rubbish, almost all respondents did not notice any and this were the same for clothing and equipment left by 'other' groups (guided and non-guided). Interestingly, in terms of groups wearing the same clothing and equipment, most respondents either did not notice this. Some commented that it was a good thing because it showed that visitors were well equipped.

3.5 SUMMARY OF RESULTS

3.5.1 Characteristics of the sample groups

The country of origin, age groups, gender and group size were typical of visitors to high use, front-country sites within New Zealand's national parks.

Both visitor groups comprised over 80% of overseas visitors. This is typical for January, when the survey was undertaken.

More New Zealand visitors tended to walk unguided than those who chose the guided option. Only visitors from the UK showed any greater preference for the guided option over the non-guided. Almost all other nationalities were represented in both guided and non-guided samples.

3.5.2 Characteristics of the visit

The vast majority of both guided and non-guided visitors were on their first visit to Franz Josef Glacier. This has an important bearing on the evaluation of the visit and on perceptions of crowding, as these first time visitors have no previous experience at Franz Josef to compare current social conditions with.

Most non-guided visitors to Franz Josef Glacier also visit Fox Glacier. Guided visitors are more selective about which glacier to visit.

Most non-guided visitors did not go over the safety barrier at the end of the glacier track and could understand the reason for having it. This result is consistent with previous studies (Espiner 1998).

3.5.3 Visit evaluation

Guided and non-guided groups had a similar appreciation of the natural features in the Franz Josef Valley. The only obvious difference was that the glacial formations and the opportunity to walk on the ice was rated more highly by guided visitors—this activity is central to the guided visitor's experience.

Only a small percentage from both groups reported any dislikes. The majority of both groups reported that there was 'nothing' they disliked.

There were no significant differences between the expectations of guided and non-guided visitors. It is worth noting that more non-guided visitors thought the experience was 'as expected'. It may be that these visitors formulate expectations more clearly than guided visitors.

3.5.4 Social impacts

Guided and non-guided groups appear reasonably tolerant of each other.

There is very little evidence to suggest that increasing the number of visitors will lead to increased levels of crowding with either guided or non-guided visitors.

About one fifth of guided and non-guided visitors expressed concern over aircraft noise.

There is slight concern from both groups over encountering large groups of visitors in the valley or on the glacier.

4. Conclusion

Social impact issues among guided and non-guided visitors to Franz Josef Glacier were explored during February 2000. The research was carried out during the busiest time of the year. The Franz Josef and Fox Glaciers are both high-use, front-country sites located within Westland National Park and the South West New Zealand World Heritage Area.

The results of this research suggest that there are virtually no significant differences between the demographics, expectations and impact perceptions of guided and non-guided visitors. Both groups reported similar levels of appreciation of the natural qualities of the Franz Josef Valley and the glacier itself. Both groups reported similar levels of concern over aircraft noise and seeing large groups of people in the valley or on the glacier. Similar perceptions of crowding by both groups suggest that the number of encounters with other visitors, both on the glacier and in the valley floor, may have little bearing on overall crowding perceptions. It is likely that increases in total visitor numbers would be tolerated, if not expected, at what is a high use site.

In light of these results, there does not appear to be any evidence serious enough to warrant immediate management action to address crowding or conflict within or between guided and non-guided groups.

Increases in the number of guided visitors on the glacier may raise more safety issues, rather than issues related to crowding, or inter-group conflict.

Although impact perceptions from both groups were not significant, it is suggested that the level of impact perception is monitored over the next three years to assess any changes that may occur as a result of increasing or decreasing levels of demand, particularly from guided visitors.

Results from this research suggest strongly that guided and non-guided visitors should not be thought of or treated as being two markedly different social groups. The data illustrate that if anything, guided and non-guided visitors have similar social characteristics and appreciation of the New Zealand national parks, and are likely to be concerned about the same things—such as aircraft noise, or seeing other large groups of visitors.

5. Recommendations

Based on the results of this survey, three steps for future visitor monitoring at Franz Josef Glacier are recommended:

- A shortened version of the survey should be repeated over the next three years to monitor crowding and conflict at Franz Josef Glacier between and within guided and non-guided groups. Surveyors should consider including in-depth qualitative interviews as part of the monitoring programme and correlate results with track counter data.
- Review the results annually and assess future monitoring needs after three years.
- Maintain the open research partnership developed between DOC and the Franz Josef guiding companies, during this study.

6. Acknowledgements

This research project was made possible with the support of DOC's Science and Research Division (investigation no. 3269) and the Franz Josef Glacier guiding companies. Their open and honest approach with the research team was greatly appreciated. DOC staff from Franz Josef Area Office, Hokitika Conservancy Office and Science and Research Division in Wellington were also vitally important for pilot testing the survey, assisting the research team with background material and comments on the draft report.

7. References

- Cessford, G.C. 1999a: Social impacts of visitors to conservation lands. Part 1 Research and information needs. *Science & Research Internal Report 171*. Department of Conservation, Wellington.
- Cessford, G.C. 1999b: Social impacts of visitors to conservation lands. Part 2 Workshop proceedings. *Science & Research Internal Report 172*. Department of Conservation, Wellington.
- Espiner, S.R. 1999: The use and effect of hazard warning signs. *Science for Conservation 108*. Department of Conservation, Wellington.
- Moore, K. 1995: Understanding the individual recreationist: From motivation to satisfaction. Pp. 63–97 in Devlin, P.J.; Corbett, R.A.; Peebles, C.J. (Eds) *Outdoor recreation in New Zealand*. Vol. 1. Department of Conservation (and Lincoln University), Wellington.
- Oliver, G.D. 1995: Social impact of visitors and aircraft in the vicinity of the Fox and Franz Josef Glaciers: assessing the carrying capacities. Unpublished MSc thesis, Aberystwyth University, Wales.
- Sutton, S. 1998: Visitor perception of aircraft activity and crowding at Franz Josef and Fox Glaciers. *Science for Conservation 94*. Department of Conservation, Wellington.

Appendix 1

FRANZ JOSEF GLACIER VISITOR SURVEY



Department of Conservation
Te Papa Atawhai

Franz Josef Glacier Visitor Survey

ID No. _____ Date _____ Time of day _____ Weather - _____

Hi, my name is On behalf of the Department of Conservation, I'm trying to find out what people thought of their trip to the glacier. Would you mind answering a few questions - it will take about 5 minutes.

1. Was this your first visit here? YES, first time (81%) NO - how many times before? ____
(1 visit: 14%, 2 visits: 2%, 3 visits: 2%, 3+ visits: 1%)
2. Where did you get to in the valley today?
 Walked on glacier (1%) Up to the ropes (55%) Only to river bed/moraine (19%)
 Other (23%) _____
3. How long was your visit in the glacier valley today? (refer Results)
4. Are you going to Fox Glacier as part of your visit to the area?
 YES, just been (26%) YES, going there soon (40%) NO, only Franz Josef (28%)
 NO, seen Fox before (6%)
5. What were the best things about your walk in the valley today?
 Refer Results
6. Was there anything that you did not like about your walk?
 Refer Results
7. Did you do anything to change or avoid those things that you did not like?
 Refer Results
8. Overall, did you feel crowded at any stage? (Interviewer to lead in...)

Not at all		Slightly		Moderately		Extremely		
Crowded		Crowded		Crowded		Crowded		
1	2	3	4	5	6	7	8	9
(48%)	(15%)	(19%)	(5%)	(3%)	(7%)	(1%)	(1%)	(1%)
9. **If Crowded (score Over 5)** - Where did you feel most crowded? Refer Results _____

10. Please take a look at this table. .

Some things can impact on enjoying a visit, did you notice any of these things here, did they concern you (and if YES, how much)?	NO	YES			
	Didn't notice this	But didn't bother me	Slight concern	Moderate concern	Highly concerned
Hearing aircraft overhead.	1 (13%)	2 (61%)	3 (17%)	4 (6%)	5 (3%)
Helicopters landing while you're up on the glacier.	1 (75%)	2 (20%)	3 (2%)	4 (2%)	5 (1%)
Seeing rubbish.	1 (89%)	2 (5%)	3 (5%)	4 (2%)	5 (1%)
Seeing clothes and equipment left at the glacier face by other groups.	1 (51%)	2 (47%)	3 (1%)	4 (1%)	5 (0%)
Seeing large groups of people.	1 (22%)	2 (57%)	3 (17%)	4 (2%)	5 (2%)
Seeing some people go past the safety barriers and signs.	1 (61%)	2 (21%)	3 (12%)	4 (3%)	5 (1%)
Seeing other groups all using the same jackets and equipment.	1 (N/A)	2	3	4	5
Seeing other guided groups while up on the glacier.	1 (15%)	2 (75%)	3 (18%)	4 (2%)	5 (0%)

11. Any other comments about your trip on the glacier today?....

Refer Results

12. Just tell us a little bit about your self now

● **Age group** under 20 (6%) 20-24 (32%) 25-29 (29%) 30-34 (13%) 35-39 (3%)
 40-44 (3%) 45-49 (3%) 50-54 (3%) 55-59 (4%) 60-64 (2%)
 65-69 (2%) 70+

● **Gender** Male (42%) Female (58%) ● **Nationality** Refer Results _____

● **If New Zealander –where do you live?** Refer Results _____

THANK YOU FOR YOUR ASSISTANCE



ID No. _____ Date _____ Time of day _____ Weather -

Hi, my name is On behalf of the Department of Conservation, I'm trying to find out what people thought of their trip to the glacier. Would you mind answering a few questions - it will take about 5 minutes.

1. Was this your first visit here? YES, first time (96%) NO - how many times before? _____
(1 visit: 3%, 2 visits: 1%)

2. Where did you get to today?
 Walked on glacier (Half Day) (50%) Walked on glacier (Full Day) (47%)
 Other (3% - ~~Heli~~ - Hike) _____

3. Are you going to Fox Glacier as part of your visit to the area?
 YES, just been (16%) YES, going there soon (23%) NO, only Franz Josef (57%)
 NO, seen Fox before (4%)

4. What were the best things about your trip to the glacier?
Refer Results

5. Was there anything that you did not like about your trip on the glacier?
Refer Results

6. Did you do anything to change or avoid those things that you did not like?
Refer Results

7. Overall, did you feel crowded at any stage? (Interviewer lead in...)

Not at all Crowded		Slightly Crowded		Moderately Crowded		Extremely Crowded		
1	2	3	4	5	6	7	8	9
(34%)	(26%)	(18%)	(11%)	(4%)	(3%)	(2%)	(1%)	(1%)

8. **If Crowded (score Over 3)** - Where did you feel most crowded? _____

9. Overall, was your trip to the glacier...

1	2	3	4	5
Much better than expected (36%)	Slightly better than expected (35%)	As expected (24%)	Not as good as expected (5%)	Much worse than expected (0%)

10. Overall, was your trip in the valley...

1	2	3	4	5	
Much better than expected (33%)		Slightly better than expected (28%)	As expected (37%)	Not as good as expected (2%)	Much worse than expected (0%)

11. Please take a look at this table...

Some things can impact on enjoying a visit. Did you notice any of these things here, did they concern you (and if YES, how much)?	NO		YES		
	Didn't notice this	But didn't bother me	Slight concern	Moderate concern	Highly concerned
Hearing aircraft overhead	1 (25%)	2 (53%)	3 (6%)	4 (10%)	5 (6%)
Seeing rubbish.	1 (85%)	2 (4%)	3 (5%)	4 (3%)	5 (3%)
Seeing clothes and equipment left by guided groups at the glacier.	1 (89%)	2 (11%)	3	4	5
Seeing large groups of people while walking on the track.	1 (23%)	2 (58%)	3 (13%)	4 (4%)	5 (4%)
Seeing some people go past the safety barriers and signs.	1 (36%)	2 (47%)	3 (9%)	4 (4%)	5 (4%)
Seeing guided groups go past safety barriers while we are not meant to.	1 (50%)	2 (41%)	3 (3%)	4 (4%)	5 (2%)
Seeing groups all using the same jackets and equipment.	1 (N/A)	2	3	4	5
Having safety barriers and signs to stop us going onto the glacier.	1 (18%)	2 (63%)	3 (10%)	4 (6%)	5 (3%)

12. Any other comments about your trip to the glacier today?

Refer Results

13. Just tell us a little bit about your self now....

- Age group under 20 (2%) 20-24 (11%) 25-29 (23%) 30-34 (10%) 35-39 (7%)
 40-44 (4%) 45-49 (6%) 50-54 (14%) 55-59 (13%) 60-64 (6%)
 65-69 (3%) 70+ (2%)

- Gender Male (56%) Female (44%)

● Nationality Refer Results _____

- If New Zealander –where do you live? Refer Results _____

- How many are in your group walking to the glacier today? (include yourself) Refer Results _____

- Did you go past the safety barriers/signs to get closer to the glacier? (ask interviewer if concerned)

YES (30%)

NO (70%)

THANK YOU FOR YOUR ASSISTANCE

Appendix 2

DETAILS OF FRANZ JOSEF CROWDING SCORES

The nine-point crowding scale used on DOC's Great Walk surveys, during 1994, was applied (for consistency and enable some degree of comparison) on this Franz Josef Visitor Survey. The responses are summarised in Table A2.1.

TABLE A2.1. FRANZ JOSEF GLACIER CROWDING SCORES.

DEGREE OF CROWDING	(SCORES)	NON GUIDED % N=273	GUIDED % N = 140
Not Crowded	(1)	48	34
	(2)	15	26
	<i>Sub total %</i>	<i>(63%)</i>	<i>(60%)</i>
Crowded—slightly	(3)	19	18
	(4)	5	11
	(5)	3	4
	<i>Sub total %</i>	<i>(27%)</i>	<i>(33%)</i>
Crowded—moderately	(6)	7	3
	(7)	1	2
	<i>Sub total %</i>	<i>(8%)</i>	<i>(5%)</i>
Crowded—extremely	(8)	1	1
	(9)	1	1
	<i>Sub total %</i>	<i>(2%)</i>	<i>(2%)</i>
Total Crowded		37%	40%

Those non-guided visitors feeling 'slightly crowded' amount to 27%, 'moderately crowded' 8% and extremely crowded 2%, the total percentage of those reporting a degree of crowding is 37%. For guided visitors, the results are similar with 'slightly crowded' at 33%, 'moderately crowded' at 5% and 'extremely crowded' at 2%; a total crowding percentage of 40%.

Appendix 3

UNPROMPTED COMMENTS

Where appropriate, these have been used within the previous section of results to add greater depth and clarity to the statistics. In this section, it is worth noting the way in which unprompted comments contributed towards an understanding of other management issues on the Franz Josef Glacier.

Non-guided visitors

Out of 273 non-guided respondents, 66 (24%) made unprompted comments. Table A3.1 summarises the category and number of comments.

TABLE A3.1. UNPROMPTED COMMENTS BY NON-GUIDED VISITORS.

TOPIC	NUMBER OF COMMENTS
Signs	26
Safety barrier	17
Crowds/other people	3
Guided groups	4
Aircraft	1
Management (general)	15

In relation to signs, 20 comments were either negative, or suggested improvements, while 6 were positive. Some negative comments included:

- *Safety signs in car park a bit confusing*
- *Track could be better marked*
- *Realise the signs need to be there, but are over the top*
- *Too many signs warning of all this danger...I like the riverbed where there are no signs in my face...*
- *More signs needed to prepare people especially elderly and the young that there is unsuitable terrain..*

Other suggested changes reflect that some visitors do not take in all that is on the signs already:

- *Signs ineffective as people going past them. Should say something like 'proceed at own risk'.*
- *More signs needed along the track (explaining ones)*
- *Need sign to indicate appropriate footwear for the terrain*

Positive comments included:

- *Good signs in place with the information*
- *Well sign posted track and well maintained*

In relation to the safety barrier, the following comments were provided:

- *Safety barriers good, provides information and leaves people to make up their own minds*
- *Confused over the danger—not clear, barriers don't seem to work*
- *Rope should be closer to glacier so you can touch the ice*
- *Barriers don't stop anything and it should be the choice of the individual whether they want the risk or not*

Comments relating to crowds and guiding groups have been incorporated into previous sections. Those relating to other aspects of park management included:

- *Wife disabled, would be nice to get her to viewpoint; she's still in the car park*
- *Impressed by management*
- *A good job at keeping it natural*
- *I'm glad its not highly regulated as similar experiences are*

Even though the number of comments is small, some interesting insights have been provided into disabled access, getting close to the glacier, the difficulty of the track (in places) and the effectiveness of the signs.

Guided visitors

Of the 140 guided respondents, 23 (16%) provided further unprompted comments. Table A3.2 summarises these comments.

TABLE A3.2. UNPROMPTED COMMENTS BY GUIDED RESPONDENTS.

TOPIC	NUMBER OF COMMENTS
Guide/tour management	14
Experience	2
Crowds	5
Aircraft	1
Park management	1

Comments related to the guide or tour management included:

- *Great guides*
- *More information on scientific background about glacier formation at the start of the trip would have been helpful*
- *Could have been a guide at the back of the group, as the group was quite long*
- *The history was wonderful*

In terms of experience, the comments were very positive:

- *Excellent, one of the best things I've done in New Zealand*
- *Don't realise how good it is until you're up there*

Other crowding comments have already been mentioned elsewhere in the report, however it is worth noting:

- *Most congested from the half way point to the beginning. Maybe they should be on a separate trail.*

For aircraft, the response was quite clear:

- *Helicopters annoying*

In relation to park management, the only comment centred on the impact of visitors on the glacier:

- *Is my walking on the glacier going to affect its future?*