

# **MONITORING THE EFFECTS OF AIRCRAFT OVER-FLIGHTS ON VISITORS TO THE GLACIERS, WESTLAND *TAI POUTINI* NATIONAL PARK, NEW ZEALAND**

**A REPORT PRESENTING RESULTS FROM THE 2013 VISITOR SURVEY**

**PREPARED FOR**

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Photograph 1 (Cover) Fox Glacier from Chalet Lookout (Jude Wilson)

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## Executive summary

Documented assessments of the effects of aircraft over-flights on visitors to Westland *Tai Poutini* Fox and Franz Josef Glaciers date back to 2000, following the development of a nation-wide standard operating procedure (Booth et al., 1997) for monitoring potential social impacts on public conservation lands. The Department of Conservation (DOC) now has sound longitudinal data tracking the effects of over-flights in the two target valleys, and is able to use the results of this monitoring to inform some of its management planning.

The present monitoring report (2013) was prompted after a decision was made in April 2012 to allow for a temporary increase in the number of aircraft landings on the Franz Josef Glacier / *Ka Roimata o Hine Hukatere* after it became unsafe to access the glacier on foot via the valley floor. In order to facilitate continued access for guided clients onto the glacier, Franz Josef Glacier Guides Ltd was granted a temporary aircraft landing concession to allow for an additional 60 aircraft landings per day for 'Ice Explorer' trips at the approved landing site at Luncheon Rock.

After discussion with Franz Josef Glacier Guides and the Mount Cook and Westland National Park Resident Aircraft User Group, it was also agreed to trial a flight path up the true left of the Franz Josef Glacier at an altitude 500 ft lower over the terminal face for the Ice Explorer trips to improve flight safety by providing separation from scenic over-flights and to allow for a more direct flight path to the landing site. An amendment was also proposed to the Westland *Tai Poutini* National Park Management Plan to provide a policy to allow for a temporary increase in the number of permitted aircraft landings on the glacier.

A likely consequence of this temporary concession was a substantial increase in the number of over-flights in the Franz Josef Glacier valley, hence the value in reassessing the effects of aircraft on visitors in both the Franz and Fox Glacier valleys.

## Approach

The 2013 monitoring survey was based on the Department's SOP for monitoring the effects of aircraft over-flights (Booth et al., 1997) and implemented over two nine-day periods in late December 2012 / early January 2013 and mid-late February 2013. Visitors were surveyed on the four walking tracks used for previous monitor surveys: the Fox and Franz Josef Glacier Valley walks; the Robert's Point track; and the Chalet Lookout track.

A total of 1192 people were surveyed at the four sites, with 38 per cent conducted in the first survey period and 62 per cent in the second. During the survey period, a total of 1873 flights (take-offs) were recorded (based on a survey of Glacier aircraft operators), later calculated as representing a total of 3444 glacier valley over-flights.

The 2013 monitor was characterised by contrasting weather conditions. The first survey period was disrupted by a heavy rain event which grounded aircraft operators for several days, and caused widespread flooding, power outages and other storm damage to the region. Critically, a bridge was washed away on State Highway 6 at Harihari, preventing road access to the glacier region from the north for nearly a week, one consequence of which was a dramatic decline in the number of visitors to the glaciers. Damage to tracks in the valleys also constrained visitor options in this period. The Robert's Point track, in particular, sustained such storm damage that it was rendered non-operational for the remainder of the monitoring period. In contrast, the second survey period was

characterised by a nine day period of fine weather, although several days had low cloud conditions that limited aircraft activity. While challenging, the dynamic conditions were not unexpected and the data collection strategies were sufficiently flexible to ensure that the implementation of the monitor was not unduly compromised.

## **Key findings**

### **A) Aircraft over-flight activity data**

1. While data from previous years is limited, the detailed flight records collated in this report suggest a substantial increase in the number of glacier over-flights since 2009. The two glacier valleys currently have very different flight activity profiles, with over-flights at Franz Josef approximately double those at Fox. Overall, helicopter flights outnumbered fixed-wing flights by a factor greater than ten to one.
2. Approximately 40 per cent of all valley over-flights occurred between 9am and noon, with another one third between noon and 3pm, and one fifth between 3pm and 6pm.
3. Nominal classification of relative aircraft over-flight activity revealed that 15 per cent of survey respondents experienced 'low' flight activity levels; 41 per cent 'medium' levels; 23 per cent 'high' levels; and 21 per cent 'very high' levels (the latter were all in the Franz Valley).

### **B) Visitor survey: The effects of aircraft over-flights**

4. The demographic profile (age, gender, visitor origin) of the sample appears to be similar to that reported in 2009. Nearly one third of respondents were aged between 20-29 years, and more than 20 per cent of respondents were aged 60 and above. Approximately 83 per cent of respondents were from outside New Zealand, and the common countries of residence were 'Other Europe', United Kingdom, Germany and Australia.
5. Responses to the open-ended question asking what visitors 'liked most' about their experience at glaciers tended to emphasise the natural character of the glacier and general scenic amenity. Frequent reference was also made to facilities and activities including 'good tracks', 'free access', 'free car parking', 'signs and information panels' and the 'under-developed nature of the area'.
6. Approximately 13 per cent of nominated 'dislikes' (aspects visitors 'liked least' about their experience) and 10.8 per cent of all respondents, specifically mentioned 'aircraft'. In 2009, 7.4 per cent of visitors specified 'aircraft' among their dislikes. Those respondents visiting during 'very high' flight activity levels were three times more likely than those visiting at 'low' flight activity periods to raise aircraft among the 'least liked' aspects of their experience. It is important to emphasise, however, that 'aircraft' was not the most common 'dislike' mentioned. Three other themes were more prominent, including comments relating to the glacier experience (36% of responses), many of which focussed on disappointment at not getting close to the glacier; too many people; or lack of natural history interpretation.

7. When prompted, the vast majority (95%) of respondents reporting noticing aircraft during their visits to the glacier valleys, a slight increase since 2009 (93%). Respondent estimates of the number of over-flights experienced ( $M=9.1$ ) show a substantial increase since 2009 ( $M=5.7$ ).
8. Visitors to all but one of the survey sites clearly experienced more aircraft than they had expected prior to arriving at the destination. Overall, 41 per cent of visitors reported that they had under-estimated the level of aircraft activity, compared with 29% in 2009. There was considerable variation between sites on this factor, with Franz valley (48%), Robert's Point (71%) and Chalet Lookout (47%) all showing increases (the former more than doubled) since 2009. Fox Glacier valley (27%) appears to have remained static on this variable. Those who reported that aircraft activity levels were about the same as they had expected dropped from 32 per cent in 2009 to 26% in 2013. Across all sites, respondents were most likely to report experiencing more aircraft than expected when flight activity levels were higher.
9. Approximately one third (31%) of respondents indicated that current levels of aircraft activity ('any aircraft' combined with 'the amount I've noticed on this visit') threatened to spoil their visits, compared to 23% in 2009. It should be noted here, however, that there was no option for visitors to indicate that their visits had *not* been (nor could not be) spoiled in any way by aircraft, prompting a relatively high number of non-responses to this question.
10. Although over half (61%) of all visitors felt 'neutral' in terms of how aircraft had affected their visits, 24.8% of respondents reported being 'annoyed' by aircraft – a small increase compared to 2009 when 23.1% said they were 'annoyed' by aircraft. The 2013 monitor also shows a small increase (3%) in those indicating that they 'enjoyed' aircraft, and a decrease (5%) in those who felt 'neutral' about aircraft. As is the case with many variables, there is considerable variation by site for 'annoyance', with visitors to Franz valley (from 16.5% in 2009 to 26.2% in 2013), Robert's Point (from 33.1% in 2009 to 54.3% in 2013) and Chalet Lookout (from 31.7% in 2009 to 38.3% in 2013) all showing marked increases in annoyance, while visitors to Fox revealed a decrease in annoyance (from 20.8% in 2009 to 16.8% in 2013). The increases in annoyance levels reported by visitors on the Franz Valley tracks are obvious, and will require close scrutiny by those responsible for their management.
11. It is also apparent that those who *did* report feeling 'annoyed' by aircraft ( $n=279$ ) show a higher degree of annoyance than was apparent in 2009, with more than double the proportion of visitors claiming to be 'extremely annoyed' (the numeric value of 7 on the 7-point scale). Visitors to Franz valley ( $M=4.06$ ) and Robert's Point ( $M=4.16$ ) exceeded the neutral point (4) on the 7-point scale measuring 'detraction from total enjoyment' for the first time.

While the majority of participants in the monitor continue to report feeling 'neutral' about, or 'enjoying' aircraft, the 2013 survey adds to the existing evidence that over-flights have a negative effect on some visitors' experience of the glacier valleys. These negative effects appear to have increased since 2009 and disproportionately affect visitors using the Franz Glacier valley walking tracks. To the extent that these effects contravene management objectives for these important

recreation and conservation sites, managers and operators might examine options for addressing factors such as the expectations visitors hold about the glacier experience, and revisit the appropriateness of the current number of aircraft landings permitted and the specific flight paths used.



## Introduction

This report is the eighth aircraft monitoring survey to be carried out in Westland *Tai Poutini* National Park since 2000. Prior to the current study, the most recent documentation of aircraft effects on visitors to the Glaciers was in 2009 (Anon, 2009), in which there was clear evidence of an increasing proportion of visitors reporting that their Glacier experience had been negatively affected by aircraft over-flights.

The collapse of the front 70 metres of the Franz Josef Glacier in mid-2012 made foot access unsafe and emergency changes were made to the National Park Management Plan to allow a temporary increase in the number of flights utilising the Franz Josef valley to facilitate glacier access for the glacier hiking companies (DOC, 2012). The results of on-going monitoring of the effects of flights in the glacier valleys is designed to inform future Management Plan decisions relating to appropriate levels of aircraft activity in these areas.

This 2013 monitoring was carried out using a similar methodology as was used in 2009. This included surveying visitors at four sites - Franz Josef Valley and Robert's Point at the Franz Josef Glacier and the Fox Valley and Chalet Lookout at Fox Glacier. Data were collected on the number of aircraft (both fixed wing and helicopter) that visitors had noticed, their expectations of aircraft activity levels, the impact of aircraft activity on their experiences and demographic and travel group information. This report presents the 2013 monitoring results and, where feasible, compares these with the 2009 results.

## Background

Beginning in 2000, the Department of Conservation undertook a five year programme of aircraft monitoring to assess how aircraft activity affected visitors' experiences of Westland *Tai Poutini* National Park. Visitors on four walks within the Fox and Franz Josef Valleys were surveyed at approximately the same time each summer from 2000 to 2004. The survey was based on the Department of Conservation's Standard Operating Procedure (SOP) for aircraft monitoring and Booth *et al* (1999). The SOP was generally adhered to, except for a few minor variations in some years. A monitoring report was produced at the end of each year's monitoring period. The current threshold for concern and subsequent management intervention is a visitor annoyance level of 25 per cent (personal communication, Ian Wightwick, DOC Senior Technical Advisor (Recreation), April 29, 2013).

The results over these five years were broadly consistent and some general trends were evident across the four sites. Levels of visitor annoyance with aircraft on the Franz Josef Glacier Valley walk and Fox Glacier Valley walk varied from 13-25 per cent between years, and did not exceed the management threshold for management intervention of 25 per cent. Levels of annoyance with aircraft on the two higher level tracks (Robert's Point and Chalet Lookout) were more pronounced and showed greater variability between years. The proportion of visitors annoyed by the level of aircraft activity at Robert's Point varied between 30 per cent and 50 per cent (mean of 43%) over the

five years, and at Chalet Lookout between 18 per cent and 33 per cent (mean of 25%). Thus, there was reason for management concern at both these sites, with mean levels being at or above the 25 per cent threshold.

In 2005 the survey was undertaken after consultation with the Mount Cook/Westland National Parks Resident Aircraft Air Users' Group. Four key changes were incorporated into the survey design:

1. Visitor responses to aircraft activity were surveyed across a full spectrum of levels of aircraft activity, by including samples of visitor perceptions on days of no and low aircraft activity as well as on days of medium to high aircraft activity. Previous surveys had deliberately sampled only on days when there were relatively high numbers of flights.
2. A distinction was made between fixed-wing and rotary-winged aircraft - visitors were specifically asked if they had noticed aeroplanes and/or helicopters.
3. Basic demographic information was obtained from respondents to gain a better understanding of visitors - this information comprised age, gender, nationality and visit group size.
4. A large Department of Conservation sign was placed in a prominent position at the beginning of the Robert's Point Walk for the duration of the survey period warning visitors that they were likely to experience aircraft activity on the walk (*'PLEASE NOTE. This track follows a helicopter flight path. You may experience aircraft activity during your walk.'*)

The survey was repeated in 2009 using the 2005 methodology and question format. In 2013 the only changes to these two previous surveys (i.e., the points noted above) were:

- Surveying was undertaken only on days that there was some aircraft activity
- Instead of nationality, respondents were asked 'where they normally lived?'
- DOC staff were unable to locate the Robert's Point sign, so this was not used<sup>1</sup>
- The survey was split into two survey periods

The 2013 methodology is explained fully in the next section of the report. The 2013 survey form is contained in Appendix 1.

## Method

The 2013 Aircraft Monitoring survey was conducted in two phases during the summer. Across the survey period, a total of 1192 visitors were surveyed about the effects of aircraft on their visit. The total number of flights (i.e., take-offs) recorded for the period were 1873. The following sections provide details of the survey periods and survey sites; sampling; flight records and aircraft activity calculations; data entry and analysis; and sample size and margin of error.

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<sup>1</sup> It is important to emphasise that surveying at the Robert's Point Track was ultimately compromised by the track's closure in late December 2012, preventing the monitoring of aircraft effects at this site after December 29.

## Survey periods & survey sites

In 2013, surveying was undertaken during two nine day survey periods. The first of these ran from 27<sup>th</sup> December 2012 to 4<sup>th</sup> January 2013; the second from 17<sup>th</sup> to 25<sup>th</sup> February 2013. The 2009 survey was undertaken on 18 days during the period 15 January to 19 February using one field-based surveyor. The decision to split the surveying into two phases in 2013 was based on a number of considerations:

- Having two survey periods minimised the potential effects of encountering an extended adverse weather pattern that spanned the survey period
- Ensuring representation of New Zealand visitors in the immediate post-Christmas domestic holiday period
- Logistical issues relating to the implementation of the survey over an extended period

The first survey period was severely disrupted by the weather with aircraft activity on the first two days, followed by a five day period with almost no aircraft activity (there were 6 flights on January 31<sup>st</sup>). When the weather cleared, the surveyors were able to survey two further days (i.e., with aircraft activity) although there was a steadily decreasing number of visitors (and aircraft activity) due to a bridge wash-out north of Franz Josef on State Highway 6 at Harihari (the bridge reopened on the 8<sup>th</sup> January).

In contrast, the second survey period was characterised by a nine day period of fine weather, although several days had low cloud conditions that limited aircraft activity. A more detailed summary of the weather conditions experienced (and the number of flights each day) during the two survey periods is presented in Appendix 2.

Visitors were surveyed on the four walking tracks (see Appendix 3 for maps of survey sites) used for the previous surveys. The Fox and Franz Josef Glacier Valleys are extremely dynamic environments and rock fall, changes in river course and glacial advances/retreats regularly necessitate changes in the route and length of walking tracks, particularly the valley walks. The sites selected were, as far as possible, the same as those used in 2009. The weather conditions encountered during the first survey period in 2013, however, presented some significant challenges with respect to the survey sites used.

### Franz Josef Valley Walk

This site surveyed people returning from the Terminal Face walk. During the first two days of the first survey period, access was open to a viewpoint 500 metres from the terminal face. The survey site was beside the small footbridge just beyond the end of the Forest Viewpoint (Photograph 2). On the third day of surveying, a major weather event shut down the valley beyond the Forest Viewpoint (1500 metres from the terminal face) and for the final two days of this first surveying period, the survey site was moved to the footbridge on the bush track just short of where it forks to the Sentinel Rock track (Photograph 3). The original survey site (i.e., on the riverbed just beyond the Forest Viewpoint) was used during the second survey period; access to the terminal face was to the viewpoint 500 metres from the terminal face. The return walk time from the car park to the terminal face was approximately 1.5 hours; the return walk from the car park to Forest Viewpoint was approximately 30 minutes.

### Robert's Point

The survey site was on the Robert's Point track, just before the creek crossing up valley of the Douglas Swing Bridge. The return walk time on Robert's Point track is five hours. Respondents were surveyed on their return on this track. However, this survey site was only used during the first two days of the first survey period; Roberts' Point Track was closed after the storm and had not reopened at the time of the second survey period.

### Fox Glacier Valley Walk

This site was used to intercept visitors returning from the terminal face walk. For the first two days of the first survey period, the survey site was located in a flat open area beside the first small footbridge, approximately five minutes' walk from the car park (Photograph 4). Initially, access was open to a viewpoint 200 metres from the terminal face with a return walk time from the car park of one hour. Following the storm at New Year, the glacier access track was completely washed away and no surveying was possible in the Fox Valley for the remainder of the first survey period. In the recess between the two survey periods, DOC constructed a new access track which followed a previously closed section of the old Gunbarrels track and then traversed the valley side before climbing 50 metres to a viewpoint overlooking the terminal face (from a distance of 200 metres). The return walk time was one hour, the same as for the previous track. The new survey site was located on a flat section of track approximately five minutes' walk from (and beyond view of) car park, but before the track traversed the Gunbarrels slip section (Photograph 5).



Photograph 2 Franz Josef Valley survey site (Jude Wilson)



Photograph 3 Franz Josef survey site used when track closed (Jude Wilson)



Photograph 4 Original Fox Valley survey site (Jude Wilson)



Photograph 5 New Fox Valley survey site (Jude Wilson)

### Chalet Lookout

This survey site was the entry exit of the track, a few metres from the car park at the end of the south side valley access road. From the car park the return walk on the track was 1.5 hours. Respondents were surveyed on their return on this track. The survey site was only used during the first two days of the first survey period as the track was later closed due to storm damage. The track had reopened with no changes for the second survey period.

### Sampling

Convenience sampling was employed at all four survey sites (see Booth *et al.*, 1997). The surveyors introduced themselves by name to passing visitors, explained that they were doing visitor surveys for the Department of Conservation, and asked the person/people they had approached if they had a few minutes to complete a survey. All surveyors wore Department of Conservation name badges. Respondents were given a survey form, clipboard and pen and asked to self-complete the survey form. The surveyors were available to assist if necessary. In many cases the wording before the first question had to be explained as many visitors did not understand where Westland *Tai Poutini* National Park was - more specifically they were instructed to think about their walk up to the glacier valley or viewpoint on that particular day.

Three surveyors were employed for each survey period, two of whom were present throughout both survey implementation periods. Logistically, it was most effective to utilise two surveyors at each of the survey sites as this meant survey distribution could be staggered, allowing surveyors to check that each form was complete as it was returned. With multiple sites to cover, however, on occasion there was only one surveyor present.

The survey took most people fewer than five minutes to complete. On completing the survey, participants were asked what time they had started out on their walk that day and this time, along with the current time and date, were recorded on the survey form along with a pre-coded location and survey number. This data was used to calculate the amount of time participants had been exposed to any aircraft activity (see below for description of aircraft activity calculations) and was designed to present a more accurate measure than simply taking the recommended time suggested for each walk on the track signage (as had been done in previous surveys). It also allowed for more accuracy in estimating visit times affected by the track closure and access changes.

Participants were then thanked for their time and input, and were informed that the survey was part of an on-going monitoring project and that the survey was funded by the local Aircraft User Group.

### Flight records & aircraft activity calculations

Detailed flight records were collected from the ten aircraft operators who were regularly operating in the Fox and Franz Josef areas during the survey period. The template used for this data collection is shown in Appendix 4. In previous survey years these data were open to considerable interpretation as the flight path and purpose were asked in an open-ended question. To simplify data entry for the air operators, standardise the data collection, and to minimise any interpretation errors, a number of fixed category options were devised (with the assistance of the selected flight operators). The categories used created five 'flight paths' and five 'flight purposes'.

As might have been expected, the number of flight days (and the number of flights on those days) was related closely to the weather conditions - although there were fewer flights in the final two



days of the first survey period (despite fine weather) because of reduced demand with the closure of SHW 6 at Harihari. Flight records were collected for only five days of the first survey period (there was no aircraft activity on the other four days because of the weather) and all nine days of the second survey period. Table 1 shows some key details of the total 1873 flight take-offs (full details can be found in Appendix 5):

**Table 1 Key flight details 2013 (N=1873)**

Variable	Details	Number	Percentage
Survey Period	1	687	37
Survey Period	2	1186	63
Type of Aircraft	Helicopter	1723	92
	Fixed wing	150	8
Most common Duration	10 minutes	587	31.3
	30 minutes	566	30.2
Most common Flight Path	Up/down Franz Josef Glacier	884	47.2
	Up/down Fox Glacier	361	19.3
Most common Purpose	Scenic flight/snow landing	828	44.2
	Ice Explorer	500	26.7

Helicopter flights (N=1723) outnumbered fixed-wing flights (N=150) by a factor greater than ten to one.

These 1873 flights were ‘take-offs’ only and each one actually represented two flights. Using the flight path records it was possible to calculate how many over-flights there were in each glacier valley. For each glacier valley, Flight Paths 1 and 2 represented a single flight and Flight Paths 3 and 4 represented a double flight for each valley, respectively. An additional 22 single flights were added to the Fox Glacier Valley total from the ‘Other’ category because they crossed the glacier valley. The additional 140 flights coded as ‘Other’ were not included in these calculations as they did not cross either of the glacier valleys monitored. Of the total 3444 glacier valley over-flights across the survey period, almost two thirds (65%; N=2234) were over the Franz Josef Glacier Valley and one third (35%; N=1210) over the Fox Glacier Valley.

It is not possible to ascertain exactly how many flights there were during the 2009 survey period. While there are some raw data listing the flights on each of the survey days, no flight path details are included and there is nothing to indicate if the data recorded represents a take-off or an over-flight. For some 2009 survey dates, for example, there are flights reported for both valleys; for others they are only reported for a single valley. It is possible that these simply represent the valley in which surveys were undertaken on particular days and that there were actually more flights than are recorded. Based on this it is reasonable to assume that these data describe over-flights. Following this assumption, altogether there were 1526 (over-)flights recorded for the 18 survey days in 2009, with an almost equal split between the two valleys (in 13 days at Franz Josef Glacier Valley there were 788 flights; at Fox Glacier Valley there were 738 flights over 10 days). In comparison, there were a total of 3746 over-flights recorded over 14 survey days in 2013. A greater proportion of flights were by fixed-wing aircraft in 2009 with 14 per cent of Fox Glacier flights and 7 per cent at Franz Josef Glacier valley (11% overall compared to 8% in 2013).

## Data entry & analysis

Survey data were entered into an excel spread sheet during each survey period. These data were later transferred into SPSS for analysis.

Flight data were also entered into an excel spread sheets and sorted by date, flight path and time period, before being matched to the time periods visitors were present in each of the valleys. In order to approximate the levels of aircraft activity in the valley at the time of visitation, flight data were analysed according to five time periods across each day (Table 2).

**Table 2 Number of glacier valley over-flights by time period (N=3444)**

Period	Time	Number of over-flights*	Percentage
0	Before 0900	280	8.1
1	0900 - 1159	1323	38.4
2	1200 - 1459	1030	29.9
3	1500 - 1759	673	19.5
4	1800 -	138	4.0

\*includes only flights where flight path encompassed one or both glacier valleys

Each visitor was also coded according to the time his or her survey was completed using the same time periods. Given that all visitor surveys were completed between the hours of 0900 and 1800, only those coded into time categories 1, 2 and 3 (Table 2) were used in subsequent calculations.

The total number of flights per time period were then calculated and used to create a relative classification of aircraft over-flight activity that could be applied to each visitor's time in Franz Josef of Fox Glacier valley (see Table 3). The nominal classifications attributed to flight activity levels represent the high variability in aircraft activity between Franz Josef and Fox Glacier valleys.

**Table 3 Number of visitors surveyed at nominal aircraft flight activity levels by glacier valley (N=1192)**

Flight Activity Level (within time period)	All survey sites		Franz Josef Glacier survey sites (N=617)		Fox Glacier survey sites (N=575)	
	Number	%	Number	%	Number	%
Low (1-29 flights)	184	15	39	6	145	25
Medium (30-49 flights)	488	41	98	16	390	68
High (50-69 flights)	275	23	235	38	40	7
Very High (70+ flights)	245	21	245	40	0	0

It needs to be emphasised that this approach allows for an approximate level of aircraft exposure to be calculated for each visitor. It is not possible to determine with any precision, the number of aircraft in any one valley at the time of each person's visit. Given the variations in flight path and purpose, and the complexities of time between take-off, glacier set-down, return to base, and return via alternative glacier valley, we believe too many sources of error are present to make judgements using mean number of flights per visitor hour (as was attempted in 2009). Furthermore, the disruption to the access tracks during the first survey period, in particular, limited the utility of 'average track times' that were employed in the 2009 calculations (Anon, 2009).

## Sample size & margin of error

A total of 1192 people were surveyed at the four sites, with 38 per cent in the first survey period and 62 per cent in the second (Table 4). A full list by individual survey day can be found in Appendix 6.

**Table 4 Sample sizes obtained by survey period and survey site 2013**

	<b>Franz Josef Valley</b>	<b>Robert's Point</b>	<b>Fox Valley</b>	<b>Chalet Lookout</b>	<b>Total</b>
Survey Period 1	205	41	160	50	456
Survey Period 2	371	-	294	71	736
Total	576	41	454	121	1192

The sampling rationale employed was designed to survey an equal number of respondents during each survey period, and for the ratio of surveys collected at individual survey sites to reflect the approximate number of visitors using each track (Booth *et al.*, 1997). Thus, more surveys were undertaken at Franz Josef valley (compared to Fox Glacier valley). To ensure a large enough data set for analysis purposes, the aim was to complete a minimum 100 surveys at each of the two lesser used sites. The weather encountered during Survey Period 1, however, affected the overall number of surveys collected during that survey period and led to the closure of the Robert's Point track (for Survey Period 2). Altogether there were four surveying days in Survey Period 1 and eight surveying days in Survey Period 2.

The total sample (n=1192) gives a margin of error of +/- 2.8%. This means that we can say with 95% confidence that any result presented falls within a 5.6% range of the proportions calculated from the total sample. Where the analysis is limited to a sub-section of the total sample, the margin of error is higher: Franz Josef Valley (+/- 4%); Robert's Point (+/- 15.3%); Fox Valley (+/- 4.6%); and Chalet Lookout (+/- 8.9%).

Across all survey days, a total of 127 visitors who were approached declined to be surveyed. Given the convenience sampling method employed this does not indicate a response rate. A record of these refusals was kept, with surveyors recording details of the person's age, gender, country of residence and reason for refusal (Table 5). 'Other' reasons for refusal included needing the toilet, feeling ill, having small children to supervise and not having glasses with them.



Table 5 Details of visitor refusals (N=127)

Descriptor	Details	Percentage
Survey site	Franz Josef Valley	48.8
	Robert's Point	1.6
	Fox Valley	40.2
	Chalet Lookout	9.4
Age	15-29 years	19.7
	30-49 years	38.6
	50-69 years	37.0
	70+ years	3.9
Gender	Male	57.5
	Female	40.9
Country of residence	New Zealand	7.9
	Overseas	92.1
Reason	No time	35.4
	Not interested	24.4
	Language difficulties	36.2
	Other	3.9

## Results

The following results section presents the demographic and travel group data first, before reporting each individual question in the order in which it appeared in the survey. Results are related to flight data where appropriate and, when relevant (and possible), the 2013 results are compared with those from 2009. Because not all surveys were complete, and because of the differences in sample size at each survey site, all results are presented as percentages (N=number completing the particular question in all results reported). Caution is required with respect to the Robert's Point data because of the small sample size (N=41).

## Demographic and travel group data

### Question 10 - Please tell us a little about yourself

Respondents were asked their age, gender, where they normally lived and how many people they were visiting the glacier with.

#### Age

Figure 1 shows that, overall, the age distribution of the 2013 survey sample was similar to the 2009 sample with the largest group of visitors aged 20-29 (32.1%), followed by those aged 60+ (20.8%). When compared to the 2009 results, a smaller proportion of the 2013 respondents (-3.9%) were aged 40-49 years. There has also been a slight rise in the proportion of visitors in the two youngest age groups and the oldest age group.

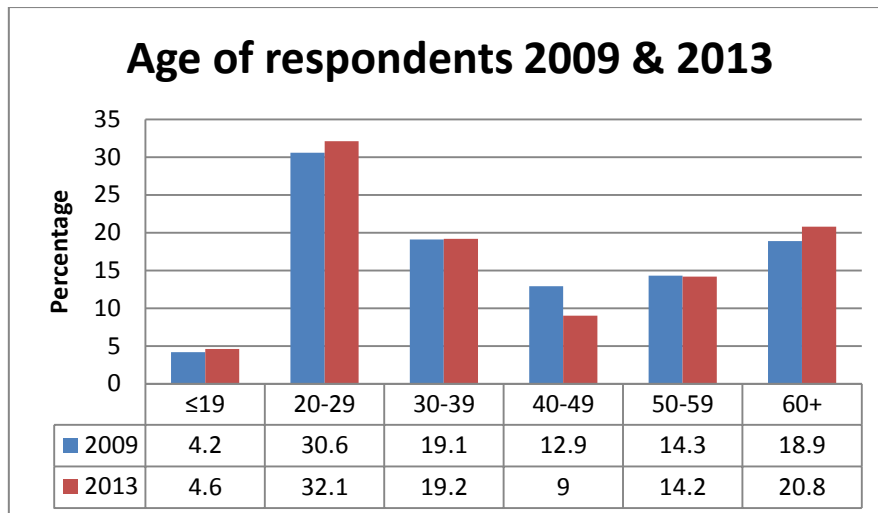


Figure 1 Age of respondents 2009 (N=unknown) & 2013 (N=1162)

Figure 2 shows the 2013 age distribution by survey site. These data show that a greater proportion of visitors from the younger and older age group were surveyed at Franz Valley while visitors were more evenly distributed across all age groups at Fox Valley and Chalet Lookout. Robert's Point attracted a higher proportion of younger visitors (most probably because it is a much longer and more challenging track to walk) although, as noted, the Robert's Point data should be treated with caution because of the small sample size.

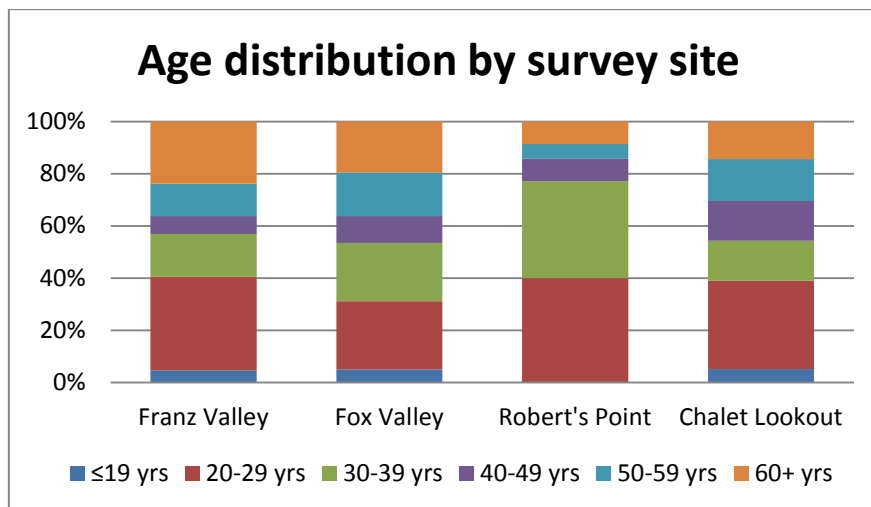


Figure 2 Age distribution by survey site 2013 (N=1162)

## Gender

Similar to 2009, males represented a higher proportion of respondents in 2013 (Table 6). The gender distribution by survey site was also similar to the 2009 sample, with a higher proportion of males surveyed at both Fox Valley and Robert's Point.

Table 6 Gender distribution 2009 & 2013 (%)

Gender	2009	2013
Male	53.6	53.1
Female	46.4	46.9

### *Where do you normally live?*

Altogether, respondents in 2013 reported 45 countries of residence. As Figure 3 shows, the largest single group were from the UK (N=211), followed by New Zealand (N=204), Germany (N=170) and then Australia (N=164). Although New Zealanders represented only 17.5 per cent of the sample overall, they represented a much higher proportion in Survey Period 1 (27.5%) compared to Survey Period 2 (11.5%). New Zealanders represented only 12.2 per cent of the survey sample in 2009 (Figure 4).

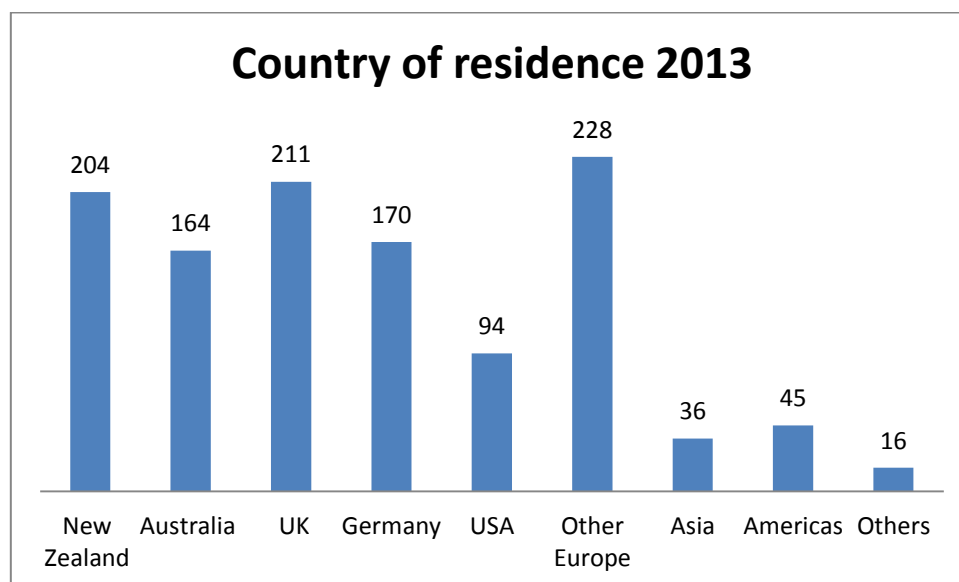


Figure 3 Country of residence of 2013 sample (N=1168)

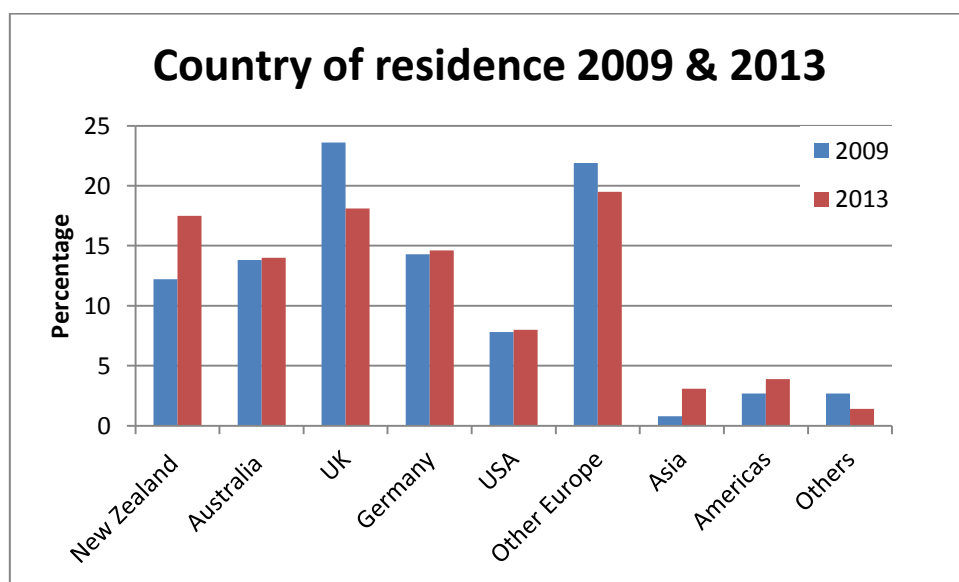


Figure 4 Country of residence (2009 = nationality) of survey sample 2009 (N=unknown) & 2013 (N=1168)

Visitors from Germany and Other Europe combined represented over a third of all visitors in the 2013 sample (34%, N=398); the most common countries of residence in 'Other Europe' were the Netherlands (N=47), France (N=44), Switzerland (N=27) and Denmark (N=21). It is also notable that, in 2013, visitors from Europe (including Germany) represented 23 different countries; in 2009, visitors from Europe represented only 17 countries (a full list of the countries of residence of the 2013 sample is shown in Appendix 7).

Asian visitors were poorly represented in the sample (3%, N=36): the largest group was from China (N=15), followed by India (N=7), Singapore (N=4), Malaysia and Taiwan (N=3 from each), Hong Kong (N=2), and one each from Korea and Indonesia. In contrast, the Asian visitors surveyed in 2009 were from only five countries (India, Japan, Korea, Sri Lanka and Malaysia). The number of Chinese visitors surveyed in 2013 (and the absence of Japanese visitors in the sample) signifies a change in the predominant Asian visitor market since 2009.

The majority of visitors from the Americas (excluding USA) were from Canada (N=32), followed by Brazil (N=7), Chile (N=4) and one each from Mexico and Argentina. In the 2009 sample the only visitors from the Americas were from Canada, Argentina and Brazil.

In 2013, 'Other' countries included Israel (N=9), South Africa (N=3), unspecified (N=2), Tahiti and UAE (N=1 from each). In 2009 visitors from Israel, South Africa and Zimbabwe were encompassed within this category.

Overall, when compared with 2009, the 2013 data reflect a much broader range of countries of origin. The changing visitor markets (e.g., more Asian and South American visitors overall and representing a greater range of countries) and the impact of the Global Economic Crisis (e.g., the fall in visitors from the UK and from some European countries) are evident. In 2013, more New Zealand visitors were surveyed in the first survey period most probably as a result of this survey period coinciding with the New Zealand Christmas holidays.

### *How many people are in your group?*

Group sizes in 2013 were very similar to those reported for the 2009 survey (Table 7). Small differences are apparent between the two survey implementation phases, with slightly larger mean group size associated with the December-January period (M=3.1) compared with the February phase (M=2.8). This is likely to reflect the greater family orientation of groups in first survey period, when there were more New Zealanders present at the sites.

**Table 7 Key data describing visit group size 2009 (N=961) & 2013 (N=1165)**

<b>Group size</b>	<b>2009</b>	<b>2013</b>
Range	1 - 52	1 - 40
Mean	3.0	2.95
Mode	2	2

## The Westland *Tai Poutini* National Park Experience

### Question 1 - What have you liked the most about your visit to Westland *Tai Poutini* National Park?

The initial questions in the aircraft monitoring survey required participants to provide 'open-ended' responses to prompts about what they 'liked the most' and 'liked the least' about their visits. Altogether, 1176 respondents recorded 1479 things they liked. These responses were coded according to the following five categories (Figure 5):

1. Natural environment - included any responses which noted specific features of the natural world (e.g., waterfalls, rocks, bush, and so on) but the glaciers were not specifically noted
2. Glacier related - any comments in which the glaciers were specifically mentioned
3. Facilities and activities - comments that referred explicitly to activities in the area including tracks (other than the glacier one) and facilities (information, toilets, and so on)
4. Overall scenic amenity - broader more generic comments made about the experience (e.g., views, scenery, landscapes, and so on)
5. Other - any comments that did not fit the above categories

A full list of responses included in each category can be found in Appendix 8.

The largest category of responses with 593 comments (40% of all likes recorded) referred specifically to the glaciers, with respondents most commonly reporting that they liked 'the glaciers', 'Franz Josef Glacier', 'Fox Glacier', the 'good tracks to the glaciers' and 'free access'.

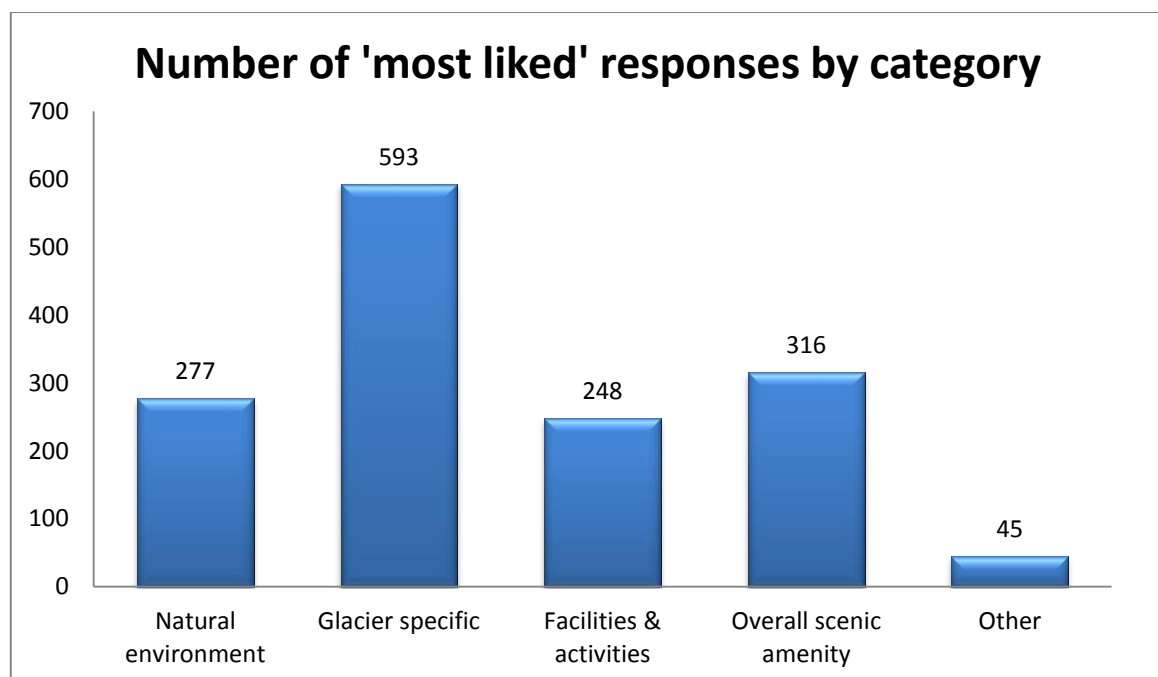


Figure 5 Number of most liked responses by category 2013 (N=1176 respondents; N=1479 responses)

Overall scenic amenity was the second most common response (21%): within this category the most common responses were 'scenery', 'landscape', 'views' and 'beautiful'.

Natural environment (most commonly 'waterfalls', 'rocks' and 'nature') and facilities and activities (most commonly 'tracks', 'free car parking', 'signage and information boards' and 'underdeveloped nature of area') attracted 19 and 17 per cent of comments respectively. Only three per cent of comments could not be coded into these four categories with the most common being 'everything' and 'lack of crowds'.

### Question 2 - What have you liked the least about your visit to Westland *Tai Poutini* National Park?

Altogether, 939 respondents recorded 1004 things they liked the least. These responses were coded according to the following five categories (Figure 6):

1. Aircraft - any mention of aircraft made
2. Glacier experience - any comments in which the glaciers were specifically noted
3. Nothing - coded if respondents had specifically recorded a comment about disliking 'nothing' (e.g., 'none, N/A, all good')
4. Westland NP experience - broader comments referring to the overall experience with no specific reference to the glaciers
5. Natural environment - comments referring to the natural environment (e.g., the weather, insects)

A full list of responses included in each category can be found in Appendix 9.

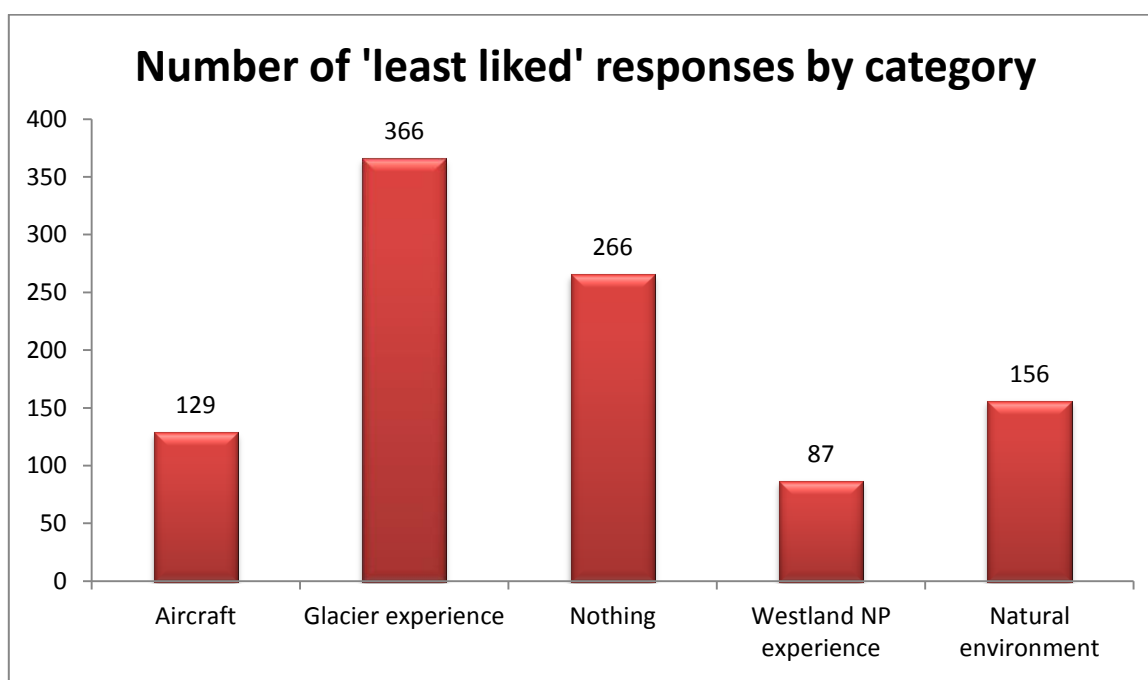


Figure 6 Number of least liked responses by category 2013 (N=939 respondents; N=1004 responses)

The largest category of 'least liked' responses (36%) related to specifically the glacier experience with the majority of these about 'not being able to get close enough to the glaciers' (particularly at Franz Josef) and 'not being able to touch the ice'. Other common complaints included 'too many people' (particularly at Fox Glacier), 'ineffective barriers' and a 'lack of interpretation signage explaining flora, fauna, geology and history of the glaciers'.

This question was unprompted and was asked before it became obvious to respondents that the survey was about the effects of aircraft over-flights. Altogether, 129 respondents (10.8% of the total sample or 13.7% of those responding to the question) reported aircraft as something they liked the least about their visit; in 2009 only 7.4 per cent of respondents mentioned aircraft as something they liked least. Overall, aircraft accounted for 13 per cent of the total (N=1004) dislikes reported (in 2009 aircraft represented 9.1% of all dislikes). As Table 8 shows, there was considerable variation by survey site in 2013, with aircraft representing a high proportion of dislikes reported at Robert's Point and a low proportion of dislikes at Fox Valley. The Robert's Point data needs to be interpreted with caution, however, due to the small sample size. The percentage of the sample reporting aircraft as a dislike followed a similar pattern in 2009 - the bracketed figures in Table 8, however, show that the proportion of respondents surveyed at both Franz Josef sites who mentioned aircraft as a dislike has increased (overall 14% in 2013) while the proportion at both Fox Glacier sites has decreased (overall 8% in 2013).

**Table 8 Percentage reporting aircraft as a dislike in 2013 by survey site (available 2009 figures in brackets)**

	<b>Franz Valley</b>	<b>Robert's Point</b>	<b>Fox Valley</b>	<b>Chalet Lookout</b>
Aircraft as % of dislikes reported	14	40	8	16
% of respondents reporting aircraft as a dislike	12 (5.7)	34 (9.2)	6 (9.6)	13 (19.8)

Of the specific aircraft dislikes reported, the most common was 'helicopter noise', followed by just 'helicopter' and the 'number of helicopters'. A number of respondents, however, expressed disappointment with the price and availability of helicopter activities and with the limited number of non-helicopter glacier activities available to visitors. There were also a number of comments made verbally to surveyors about the noise from helicopter activity in Franz Josef village being much worse than what was experienced up the valley.

Those visiting in groups of 5 people or more were much less likely to nominate aircraft as a dislike compared with those in groups of fewer than five members. There was no significant difference between those visitors from New Zealand and overseas.

Figure 7 graphs respondents according to whether they reported aircraft as a 'least liked' aspect of their visit or did not mention aircraft against the flight activity level they experienced during their visit time. Altogether, 59 per cent of those who reported aircraft as a 'least liked' aspect were exposed to either 'high' or 'very high' levels of aircraft activity. Of those who did not mention aircraft, an almost identical percentage (58.2%) were surveyed during 'low' or 'medium' flight activity levels. More specifically, these data show that one third (32.6%) of those who reported aircraft as a dislike were surveyed during 'very high' flight activity levels, compared to only 11.6 per

cent during 'low' flight activity levels. Overall, 21 per cent of respondents were surveyed during 'very high' flight activity levels and 15 per cent were exposed to 'low' flight activity levels (Table 3).

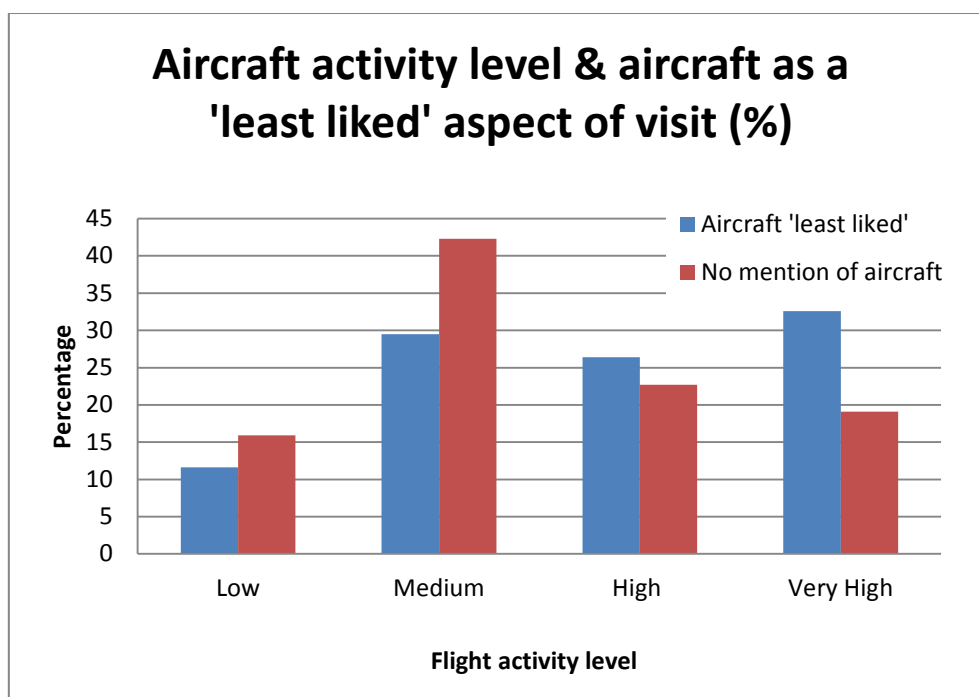


Figure 7 Aircraft activity level & aircraft as a 'least liked' aspect of visit (N=1192)

Just over a quarter of responses (26%), recorded by 28 per cent of respondents, indicated that there was 'nothing', 'N/A' or 'all good' that they least liked. This does not include those respondents who did not answer the question.

The natural environment (mostly 'sandflies', weather related comments in the survey days after the January storm and more general weather related comments - 'too hot', 'too cold' at other times) attracted 16 per cent of negative comments. The Westland NP experience ('high prices' across all categories, 'lack of DOC campgrounds', the 'presence and behaviour of other tourists') accounted for a further nine per cent.

## Aircraft noticed by visitors

**Question 3 - Have you noticed any aircraft during this visit? By aircraft we mean both helicopters and/or aeroplanes.**

Of the 1183 respondents who answered this question, 95 per cent (N=1124) reported noticing aircraft and five per cent (N=59) of respondents reported not noticing any aircraft (despite being surveyed when there was aircraft activity). Of those who noticed aircraft, 94 per cent (N=1111) noticed helicopters and 22 per cent (N=257) noticed aeroplanes.



Given that only eight per cent (N=150) of the total 1873 flights (take-offs) were by fixed wing aircraft and, of these, only 26 flights crossed the glacier valleys (the others were all sky dive flights), it is probable that some respondents were inaccurate in their perceptions about the aircraft type. During both survey periods the surveyors (who were present at the various survey sites for many hours on each survey day) noticed very few fixed wing aircraft.

Over half (N=34) of the 59 respondents who reported not noticing any aircraft were surveyed at Fox Glacier (47% at Fox Valley and 10% at Chalet Lookout); of those who did NOT notice aircraft at Franz Josef Glacier, 34 per cent were surveyed in the Valley and only eight per cent at Robert's Point.

## Number of aircraft noticed

**Question 4 - What number of aircraft have you noticed on this visit? Count each aircraft fly-over separately even if it was the same craft.**

Across all sites, the mean number of aircraft noticed by visitors was 9.12 (Table 9). The mean number of flights calculation excludes the 44 respondents who reported that there were too many aircraft to count (or similar). As Table 9 shows, the mean number of flights reported, and the proportion of the sample reporting too many aircraft to count, varied by survey site with more aircraft noticed at both Franz Josef Glacier sites. Again, caution is advised with regard to the Robert's Point results due to the small sample size.

**Table 9 Mean number of aircraft noticed 2013 (N=1021) & 2009; 'excessive number noticed' 2013 (N=44)**

	Mean* number of aircraft noticed		Respondents reporting 'too many aircraft to count' (or similar)	
	2009	2013	%	Number
Franz Josef Valley (N=489)	4.4	10.74	6.1	32
Robert's Point (N=29)	10.9	24.52	12.1	4
Fox Valley (N=395)	5.0	6.28	1.0	4
Chalet Lookout (N=108)	5.8	8.06	3.6	4
All sites (N=1021)	5.7	9.12	4.1	44

Table 9 also shows the mean number of flights noticed in 2009. For all sites, there was an increase in 2013 with the two Franz Josef sites more than doubling. These results directly reflect the increase in the number of flights over the Franz Josef Valley in 2013 and how busy that valley is compared to Fox Glacier Valley in respect of aircraft activity. As noted, 65 per cent of the over-flights during the survey period were over the Franz Josef Valley. In comparison, available figures suggest that the two glacier valleys experienced a roughly similar number of over-flights in 2009.

The 'flight activity levels' approximated earlier, suggest that, for the majority of survey days, the number of over-flights in each of the three time periods (on average), would have exceeded 12 per hour.

In additional analysis, the number of aircraft noticed by respondents was divided into 4 categories: i) those reporting between 1 and 5 aircraft; ii) those reporting between 6 and 10 aircraft; iii) those

reporting between 11 and 20 aircraft; and those reporting more than 20 aircraft. This analysis revealed that those visitors who noticed more than 20 aircraft were more than three times as likely (34.7%) to nominate aircraft among their 'dislikes' in Question 2, when compared to those who noticed between 1 and 5 aircraft (9.9%). This is suggestive of a relationship between the number of flights noticed and a negative effect on the visitor experience.

It is instructive to note a number of issues with the responses to Question 4. Altogether 44 respondents wrote that there were 'too many aircraft to count', 'lot's', 'many' and a variety of other phrases to indicate an excessive number of aircraft - these were coded as a separate group with no number value. In other instances, recoding was undertaken to assign single number values as follows:

- If a range of numbers was given the mid-point of these (or the higher side of mid-point) was recorded
- If the spread was only one number apart (e.g., 6-7) the higher number was recorded
- If more than a specific number was given (e.g., >20) the actual number value was recorded
- If respondents wrote 'unsure' or 'don't know' it was recorded as a non-response

We would recommend that in future this question offers closed option answers from which respondents are able to select an appropriate answer.

## Expectation of aircraft numbers

**Question 5 - Has the amount of aircraft activity you've noticed on this visit been - less/more/about the same/didn't know - than expected?)**

In 2013 for all the sites combined, 40.8 per cent said they noticed more aircraft than expected, 26.1 noticed the same amount as expected, 25.1 per cent did not know what to expect and only 8 per cent noticed fewer than they expected. There was considerable variation by survey site (Figure 8).

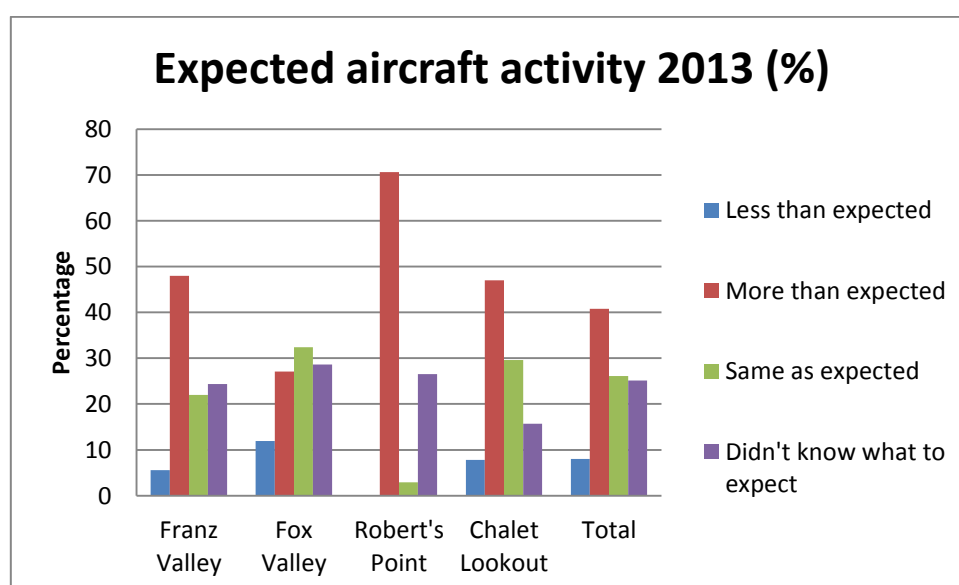


Figure 8 Expected amount of aircraft activity by survey site 2013 (N=1119)

There were also some substantial changes since 2009; in 2013 a far greater proportion of visitors reported more noticing more aircraft than expected than in 2009 at three of the survey sites (the exception being the Fox Valley site) (Table 10).

**Table 10 Expected amount of aircraft activity by survey site in 2009 and 2013 (%)**

	Franz Valley		Robert's Point		Fox Valley		Chalet Lookout		All sites	
	2009	2013	2009	2013	2009	2013	2009	2013	2009	2013
Less than expected	13.1	5.6	5.7	-	9.6	11.9	8.9	7.8	10.0	8.0
More than expected	22.0	48.0	44.0	70.6	27.4	27.1	30.6	47.0	29.0	40.8
Same as expected	32.8	22.0	28.9	2.9	33.8	32.4	32.3	29.6	32.3	26.1
Didn't know	32.1	24.4	21.4	26.5	29.2	28.6	28.2	15.7	28.7	25.1

- The largest increase in the percentage reporting more aircraft than expected was at Robert's Point (+34%) (although these results need to be treated with caution as the sample size was small), followed by Franz Valley (+26%) and Chalet Lookout (+16.4%). At Fox Valley there was a slight fall in the percentage reporting more aircraft than expected (-0.3%)
- At both Fox Glacier sites, the proportion reporting the same amount of aircraft activity as expected in 2013 was similar to 2009. At both Franz Josef sites the proportion fell (Franz Valley, -10.8%, and Robert's Point, -26%)
- At both Franz Josef sites and Chalet Lookout there was a decrease in the percentage reporting fewer aircraft than expected; at Fox Valley there was a slight increase
- Of those who didn't know what to expect, the largest decrease was at Chalet Lookout (-12.5%), followed by Franz Valley (-7.7%) and Fox Valley (-0.6%); there was a slight increase at Robert's Point (+5.1%)

In further analysis (not shown), it was revealed that 80 per cent of those who nominated aircraft as a 'dislike' in Question 2, also reported the level of aircraft activity as 'more than expected'. Just 13.7 per cent of respondents who 'disliked' aircraft in Question 2 reported aircraft activity levels to be the same or less than expected. When examined by country of residence, the data show that New Zealanders were much more likely than international visitors to report experiencing the 'same amount of aircraft activity as expected' (37% of New Zealand compared to 25% internationals). Also, New Zealanders were less likely (than international visitors) to report that they did not know how many aircraft to expect (18% compared to 27%). These findings certainly imply a link between expectation and experience. Where expectations about the number of aircraft were below the levels noticed, respondents were more likely to report aircraft as a 'least liked' feature of the visit.

Figure 9 clearly shows that the proportion of respondents reporting more aircraft activity than expected increased as the number of flights increased.

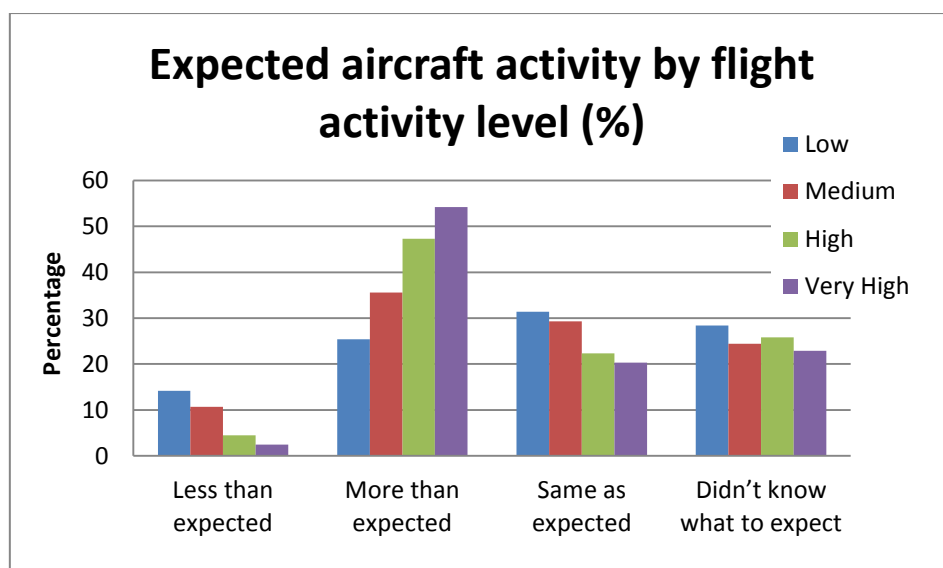


Figure 9 Expected aircraft activity by flight activity level (N=1119)

Over half (54.2%) of those who reported experiencing more aircraft activity than expected were surveyed during the very high level of flight activity, compared to only a quarter (25.4%) during low levels of flight activity. The opposite relationship was the case with those reporting either fewer or the same number of flights as expected.

## Amount of aircraft that would spoil a visit

### Question 6 - What amount of aircraft activity would spoil your visit to *Tai Poutini National Park*?

In 2013, almost half of respondents (44.2%, N=457) reported that double the amount of aircraft they had noticed this visit would spoil their visit and almost a third (30.5%, N=316) reported that any aircraft or the amount they had noticed this visit would spoil their visit (Table 11). Comparison with the 2009 results indicates that there has been a slight decrease in tolerance for aircraft.

Table 11 Amount of aircraft activity that would spoil visit 2009 (N=unknown) and 2013 (N=1035)

	2009	2013
Any aircraft at all would spoil my visit	9.4	12.9
The amount I've noticed this visit	13.3	17.6
Double the amount I've noticed this visit	47.9	44.2
Five times the amount	18.2	15.6
More than five times the amount	11.2	9.8

The previous report noted that many non-English speaking respondents had trouble understanding the word 'spoil' used in Question 6 - this was generally explained as meaning 'having a negative impact' or more simply 'make bad' (this had obviously caused issues in past surveys with the word 'impair' used instead of 'spoil' in the 2002 and 2003 surveys.) In 2013 it was found that many people were simply unable to answer Question 6 as they did not perceive their visit to be spoiled by aircraft

in any way. As a result, they were given the option not to answer this question (which generated a high number of non-responses (N=157, 13%) for the question). (NB a survey design note in the 2009 report indicated that a sixth category stating that ‘aircraft would not impair my visit’ had been included in the 2001, 2002 and 2003 surveys but not in 2000, 2004, 2005 or 2009. With hindsight, we would have preferred this option to be included.)

When examined by sample site, the 2013 data show slightly less tolerance for ANY aircraft at both Robert’s Point and Chalet Lookout. In contrast, a greater proportion of respondents surveyed at both the Franz Valley and Fox Valley sites reported that their visit would be spoiled by double the amount of aircraft they had noticed this visit (Figure 10).

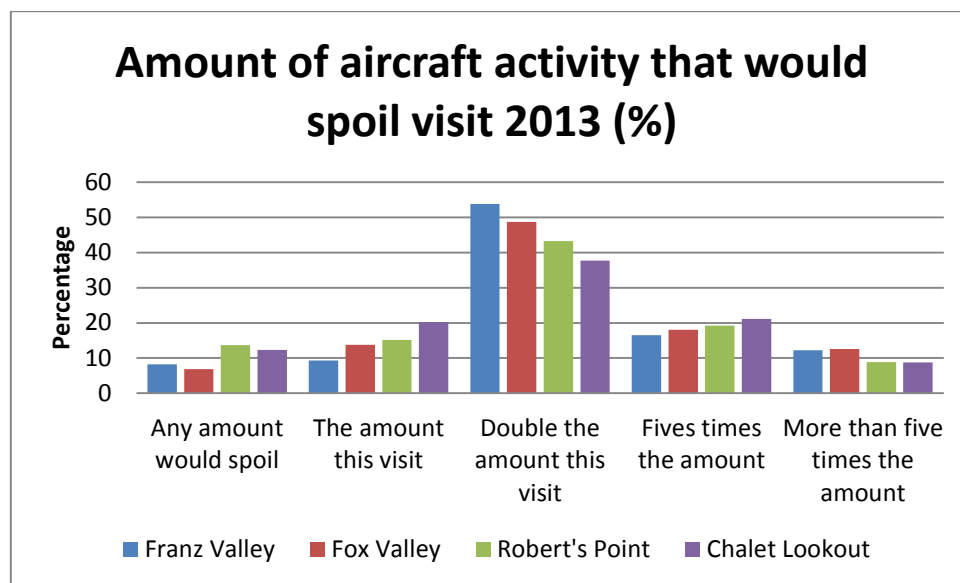


Figure 10 Amount of aircraft activity that would spoil visit by survey site 2013 (N=1035)

## Effect of aircraft on current visit

### Question 7 - How have the aircraft affected you during this visit?

For all sites combined, the majority (61%) of respondents reported being ‘neutral’ about aircraft activity; one quarter (24.8%) reported being ‘annoyed’ by aircraft; and just over ten per cent ‘enjoyed’ the presence of aircraft in the valley (Figure 11). This annoyance level is fractionally below the current 25% annoyance threshold proposed by Booth *et al* (1997), and the provisional standard documented in the Social Monitoring SOP (DOC, 2006).

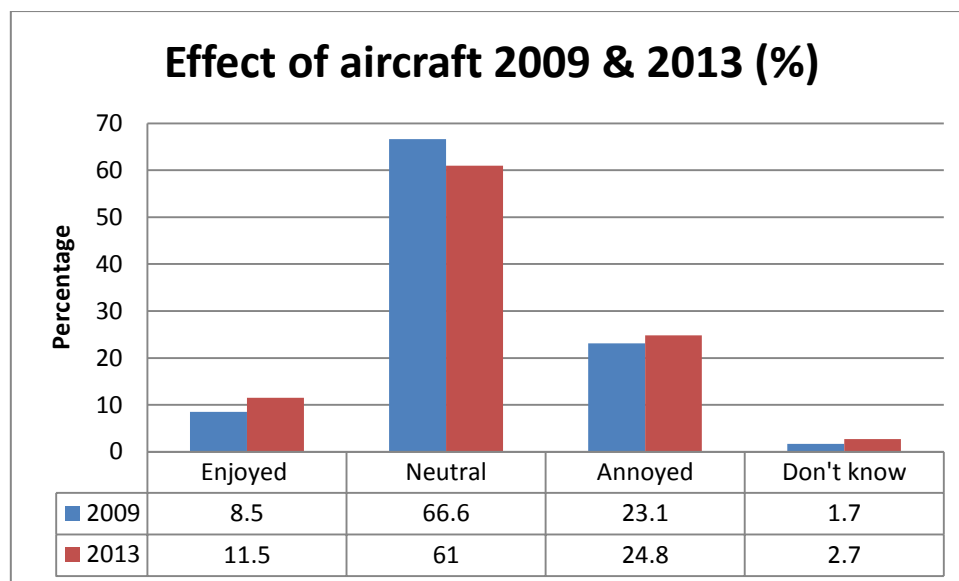


Figure 11 Effect of aircraft on experience 2009 (N=unknown) & 2013 (N=1127)

Over one third (35.5%) of those annoyed by aircraft registered 'aircraft' as a 'least liked' aspect of their visit in Question 2. Additional analysis by country of residence indicates that New Zealand visitors were twice as likely to report enjoying aircraft (19% enjoyed) than were visitors from overseas (10% enjoyed). Correspondingly, New Zealand visitors were slightly less likely to be neutral (58% compared to 62% overseas) and annoyed (21% compared to 26% overseas) by aircraft.

As Figure 11 shows, however, compared to 2009, there has been a small overall increase in both enjoyment of, and annoyance with aircraft, while the proportion reporting feeling neutral about aircraft activity has decreased.

Annoyance with aircraft activity appears to increase as the level of flight activity rises. During 'low' flight activity, 20 per cent reported annoyance, a figure that climbs to 30.1 per cent for those surveyed during 'very high' flight activity (Figure 12). When examined by individual glacier valleys, these data show that at Franz Josef the percentage annoyed increased the most (+4.2%) between exposure to 'medium' and 'high' levels of aircraft activity. The pattern is less clear at Fox Glacier valley, although there was an increase with annoyance associated with 'medium' compared to 'low' aircraft activity; only 7 respondents were exposed to 'high' aircraft activity levels and none were exposed to 'very high' levels.

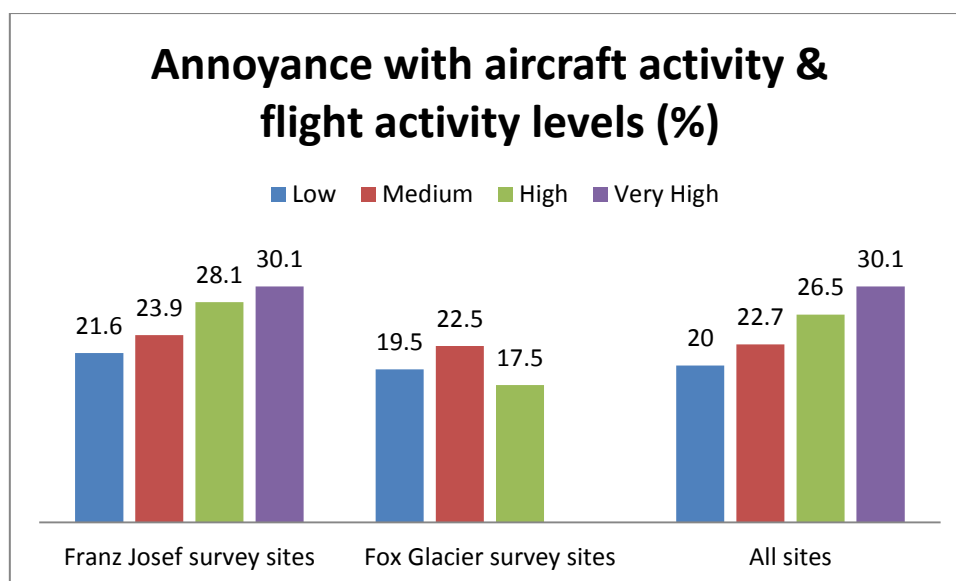


Figure 12 Annoyance with aircraft activity & flight activity levels (N=279)

Figure 13 shows the proportion of respondents reporting annoyance with aircraft at each survey site for both 2009 and 2013. In 2013, Fox Valley was the only one of the four sites at which the proportion reporting annoyance had decreased; it is also the only site at which the annoyance level is below the 25 per cent threshold (DOC, 2006). The next two questions explored this annoyance in more detail.

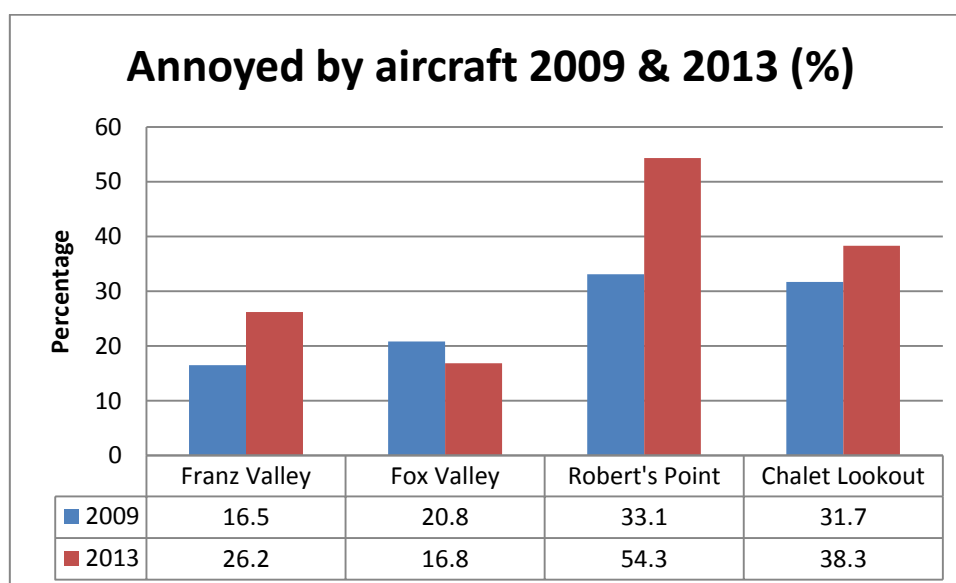


Figure 13 Annoyed by aircraft by survey site 2009 (N=unknown) & 2013 (N=279)

## Measure of aircraft annoyance

### Question 8 - How much have the aircraft annoyed you? (1-7 scale)

Question 8 was answered only by those respondents who stated that they were annoyed by aircraft in Q7 (N=279); one person did not answer Q8 or Q9 (N=278).

On the seven-point scale (where 1= 'hardly annoyed at all' through to 7 = 'extremely annoyed'), the most common responses were 4, 5 and 6 with an overall mean of 4.78 (higher than the mean of 4.4 found in 2009) (Figure 14). This suggests that those visitors annoyed by aircraft express this perception more strongly than was evident in 2009. In other words, in addition to the increased proportion of visitors reporting annoyance with aircraft, there has also been an increase in the degree of annoyance, as illustrated by those who reported being 'extremely annoyed' (+6.3%).

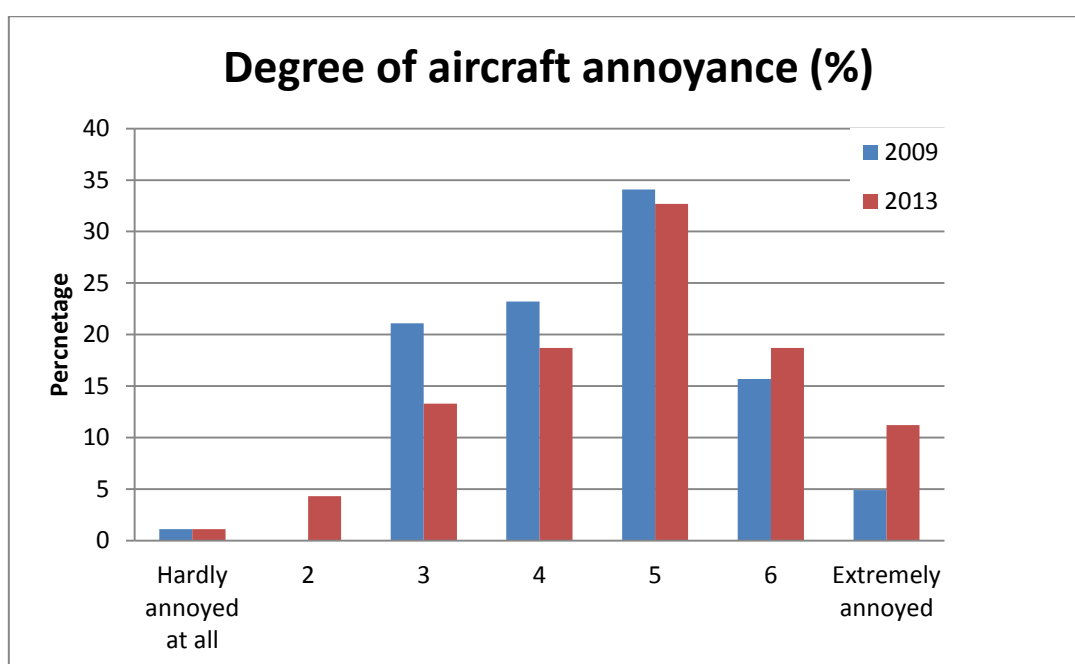


Figure 14 Degree of aircraft annoyance 2009 (N=unknown) & 2013 (N=278)

As Figure 15 shows, in 2013 the mean annoyance score (for those respondents who reported being annoyed by aircraft) was higher at all four sites than was found in 2009. The largest increase in annoyance was at the two Franz Josef Glacier survey sites.



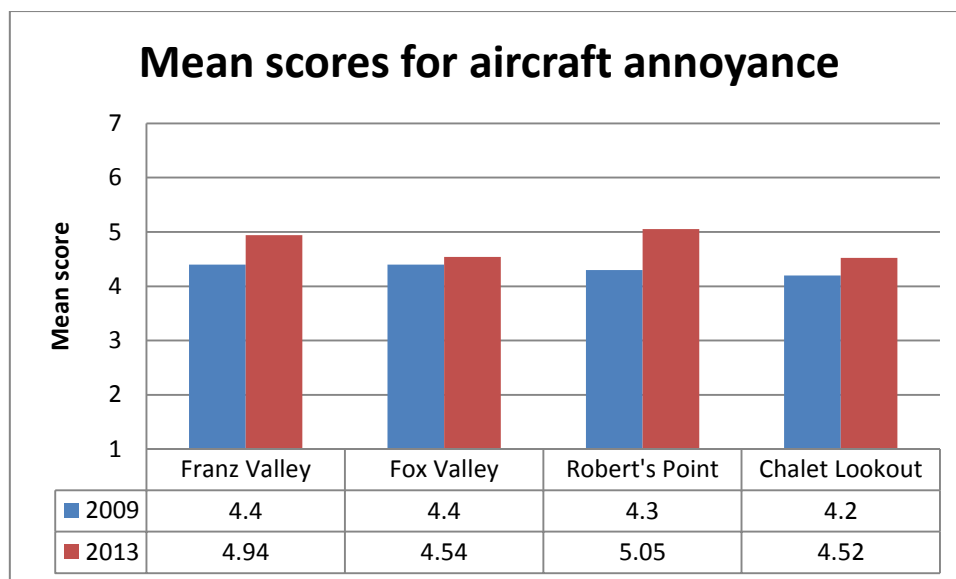


Figure 15 Mean scores for aircraft annoyance by survey site 2009 (N=unknown) & 2013 (N=278)

The mean annoyance scores also increased as the level of aircraft activity increased (Figure 16), although the differences in mean scores are slight.

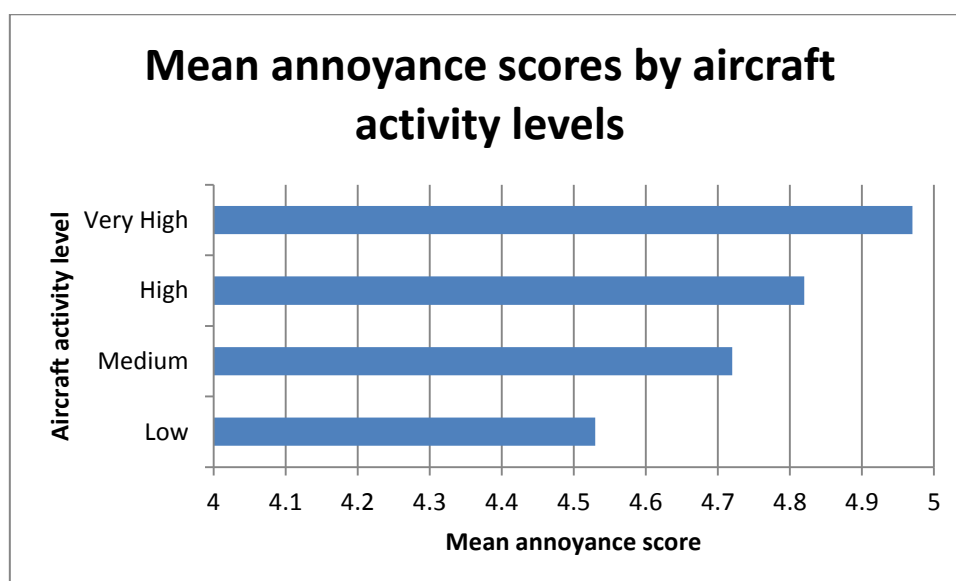


Figure 16 Mean annoyance score by aircraft activity level experienced (N=278)

## Measure of aircraft impact on visit enjoyment

**Question 9 - How much have the aircraft detracted from your total enjoyment of [this visit to Westland Tai Poutini National Park?](#) (1-7 scale)**

This question was only answered by those who were annoyed by aircraft (N=279). The mean across all sites was 3.95 (compared to 3.6 in 2009). If the score of '4' is taken as aircraft having a neutral impact on total enjoyment, and the scores on either side representing either 'no impact' (i.e., scores of 1, 2 and 3) or a 'negative impact' on total enjoyment (i.e., scores of 5, 6 and 7) there are some clear differences between the 2009 and 2013 results. In 2009, for example, over half (55.8%) reported no impact and 27.4 per cent reported a negative impact compared to only 38.1 per cent reporting no impact and 37.7 per cent reporting a negative impact in 2013 (Figure 17).

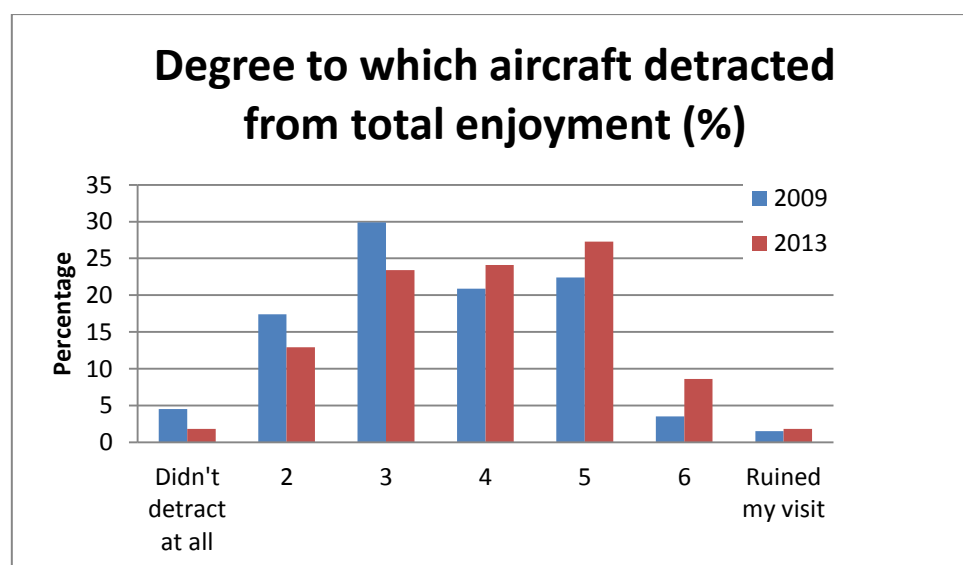


Figure 17 Degree to which aircraft detracted from total enjoyment 2009 (N=unknown) & 2013 (N=278)

As Figure 18 shows, the mean scores for how much aircraft detracted from enjoyment increased at three of the four survey sites (the exception being the Fox Valley site) with the largest increase in detraction from total enjoyment at the two Franz Josef Glacier survey sites.

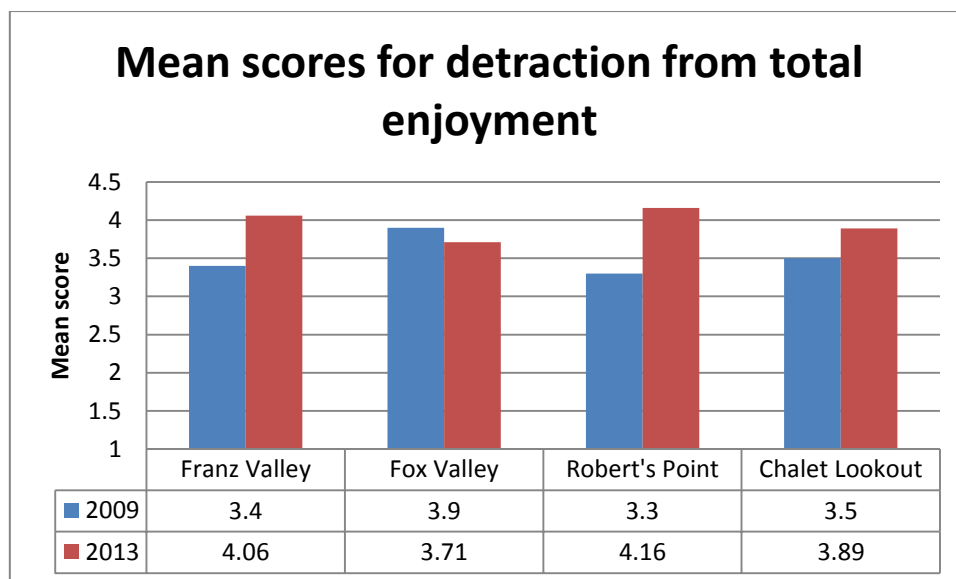


Figure 18 Mean scores for aircraft detraction by survey site 2009 (N=unknown) 2013 (N=278)

The mean score for how much aircraft detracted from enjoyment also increased as the level of aircraft activity increased (Figure 19) although these scores were lower than those for annoyance with aircraft.

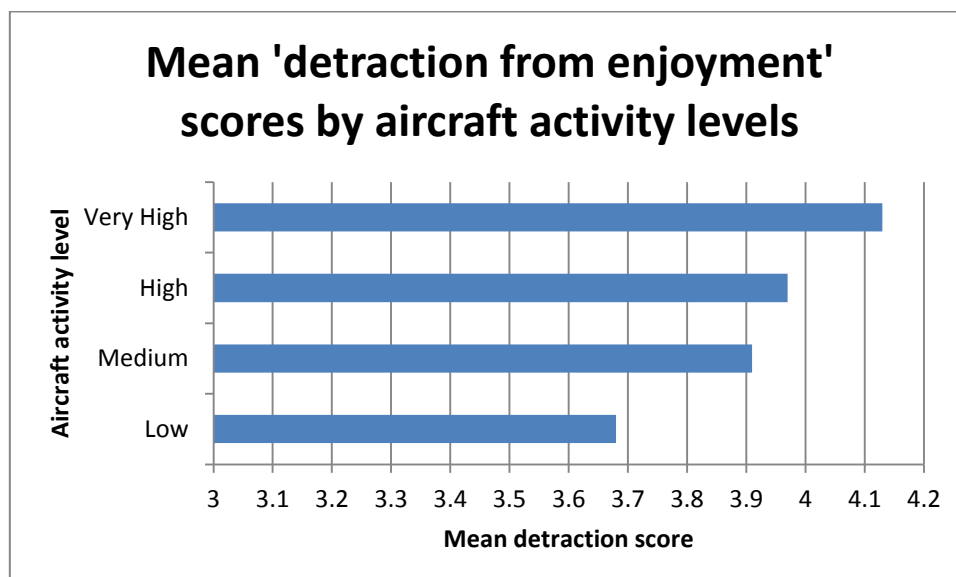


Figure 19 Mean 'detraction from enjoyment' scores by aircraft activity levels (N=278)

## Conclusion

The limited comparison possible with the flight data recorded in 2009 suggests that there has been an overall increase in the number of over-flights at the monitored sites within Westland *Tai Poutini* National Park, and a significant change in the balance of these flights (in 2013, two-thirds of all over-flights crossed the Franz Josef Glacier Valley). This is likely to have contributed to the greater proportion of visitors at the Franz Josef valley survey sites reporting negative effects of aircraft over-flights across all the measures investigated by this survey. In respect of the two main glacier valley sites, the data show that, compared to 2009, there has been a substantial increase in the proportion of visitors reporting more flights than expected at Franz Valley and that annoyance levels with flights in this valley has increased to 26.2 per cent (i.e., over the 25% threshold level). Of those who reported being annoyed by aircraft at Franz Josef Valley, 65.5 per cent rated their annoyance at the higher end of the scale (i.e., scored 5, 6 or 7). There has also been an increase in the impact of aircraft on total enjoyment at Franz Valley and aircraft were reported more often as a 'least liked' aspect of respondents' visits at the Franz Josef Valley survey site compared to Fox Valley.

In contrast, at Fox Valley there has been a slight increase in the proportion of visitors reporting fewer aircraft than expected and a drop in annoyance levels with flights since 2009. The mean scores for 'how annoyed' those visitors were at Fox Valley were only slightly higher in 2013 than in 2009. Also, in 2013 those visitors who did report annoyance with aircraft activity at Fox Valley recorded a lower mean score for aircraft influence on their total enjoyment than 2009 visitors. Of those who reported being annoyed by aircraft at Fox Valley, 57.1 per cent rated their annoyance at the higher end of the scale (i.e., scored 5, 6 or 7). Aircraft annoyance in the valleys could be tempered by other irritants (such as crowding) as these sites attract the vast majority of visitors.

The two smaller sites attract fewer visitors and it might be appropriate to assume that those visitors are looking for different type of experience. Both the Robert's Point and (to a lesser extent) the Chalet Lookout tracks offer more physically challenging experiences in a more remote wilderness setting. Visitors to Robert's Point were found to be slightly younger and many commented to surveyors that they were attracted by the longer, more remote experience offered by this track. In contrast, surveyors found that some visitors, having driven north on SH6, appeared to be visiting the Chalet Lookout site because it was the first signposted glacier access/viewpoint on the highway, rather than having an express desire for a more wilderness experience than offered by the two main glacier valley tracks. Even if this is the case, however, the visitors surveyed at Chalet Lookout were similar to previous years and had noticed more flights and had much less tolerance for aircraft activity than visitors in the Fox Valley. Data shows that there is less tolerance for flights at both Robert's Point and Chalet Lookout. At both sites, the percentage of visitors annoyed by aircraft has increased since 2009 (and, notwithstanding a relatively high margin of error at both sites, is above the 25% acceptance level).

While the majority of visitors are still neutral with regard to the effects of aircraft over-flights on their visits, in general, there has been a slight increase in annoyance with aircraft since 2009. The overall annoyance level of 24.8 per cent remains fractionally below the 25 per cent management threshold (DOC, 2006). Across all survey sites, however, the mean scores of annoyance (for those who are annoyed by flights) have increased. The impact of flights on total enjoyment has also increased markedly at the two Franz Josef Glacier Valley sites and at Chalet Lookout, but has fallen at Fox Valley. In most analyses undertaken in 2013 these impacts appear related to the level of flight

activity to which visitors were exposed. Booth *et al.*, (1997), however, noted that intensity of over-flights is only one factor that may influence visitors' reaction to aircraft. Table 12 presents a summary of factors identified by researchers that are likely to influence recreationists' reaction to aircraft (adapted from Booth *et al.*, 1997). The third column considers the relevance of these in respect of the 2013 survey findings.

**Table 12 Key factors likely to influence recreationists' reaction to aircraft & relevance to 2013 results**

<b>Factor</b>	<b>Example of effect on reaction to aircraft</b>	<b>Relevance to 2013 results</b>
ATTITUDE to aircraft in parks	If you do not want aircraft in parks, then you are more likely to be annoyed by them	This was not specifically tested, but surveyors' conversations with respondents suggested that while opinions are widely polarised (with some people absolutely against and others enjoying them) the majority are reasonably ambivalent about aircraft
EXPECTATIONS of aircraft activity	The greater your expectation of aircraft presence, the lesser your annoyance is likely to be	80% of those reporting aircraft as a dislike encountered more aircraft than expected
EXPERIENCE of backcountry/previous visits	First time visitors or those with little backcountry experience are likely to be less sensitive to aircraft; frequent backcountry users are likely to be more annoyed	No data was collected on past visitation; Robert's Point Track may attract more experienced backcountry users (as the track is longer and more difficult) but the small sample size is problematic
EFFORT EXPENDED to get to a view/natural area	The greater the effort you put into reaching an area, the greater the likelihood you will be annoyed with aircraft	Again, this may apply to respondents at Robert's Point (and to a lesser extent Chalet Lookout)
SETTING of the environment	Aircraft appear more acceptable in modified (both physically and socially) environments and less acceptable in natural environments	May apply at Chalet Lookout - this site has a smaller, less busy (and more natural) car park than found in either glacier valley and for many visitors this was their first glacier stop (i.e., before going to either village or encountering many other tourists in the area) which may have added to expectations of an unmodified environment
PURPOSE OF FLIGHTS	Scenic flights are more likely to be annoying, while rescue flights are more likely to be acceptable	A few people did note that - with the exception of rescue flights - they would prefer there to be NO flights in the National Park; others commented that they were taking a flight, or that they already done so and how much they had enjoyed this
ENTERTAINMENT VALUE	Some people consider aircraft activity as an entertainment	Some respondents did enjoy them - especially New Zealand visitors
AIRCRAFT frequency, closeness and type	You will tend to be more annoyed if there are more aircraft and if they are louder	Flights had increased markedly since 2009; the majority were helicopters (noisier); change in flight purpose meant lower flight paths in Franz Josef Valley; quite a few people commented on the annoyance of aircraft at Franz Josef Village, rather than up the valley; the side tracks (Robert's Point and Chalet Lookout) are under the flight path of aircraft and traverse higher ground

One aspect that is not considered in Table 12 is that visitors' expectations and tolerance of aircraft may be related to their country of origin. Of the international visitors surveyed, for example, visitors

from the USA had less tolerance for any aircraft activity in a national park because they are not used to this in their own country. In contrast, many European visitors commented that they were used to busy airspace over Europe and, as a consequence, aircraft activity did not particularly bother them. Many respondents engaged the surveyors in conversation after they had completed their surveys and expressed considerable interest in the monitoring survey and why it was being undertaken. Respondents were uniformly appreciative that a regular monitor was in place, and those surveyed at Franz Josef valley were generally more understanding and 'forgiving' of the high amount of aircraft activity they had encountered once they understood the reasons behind the high number of flights operating.

Compared to their international visitor counterparts, New Zealand visitors were more likely to report enjoying aircraft activity and that they had encountered the same amount of aircraft activity as they had expected. New Zealand visitors also exhibited slightly different visitor behaviour and were much more likely to visit Robert's Point, slightly more likely to visit Fox Valley and much less likely to visit Chalet Lookout. This suggests that New Zealand visitors to Westland *Tai Poutini* National Park are not only more prepared for what they may encounter during their visit, but that this prior knowledge allows them to plan or adapt their visit in order to maximise enjoyment.

## Recommendations for future surveys

1. A broader 'level of flight activity' category was devised for the 2013 analysis compared to the mean flights per hour calculation used in the 2009 survey. While still a rough measure of flight activity, it does provide useful data on exposure to flight activity, against which visitors' perceptions and opinions can be measured. It should be remembered, however, that the original monitoring method was formulated as a stand-alone measure based wholly on visitors' perceptions (and not actual flight exposure) (Booth *et al.*, 1999). The 2013 survey respondents uniformly reported noticing fewer flights than they were actually exposed to - a finding which questions the value of applying monitoring data to flight exposure data. It is, however, useful to describe the aircraft activity generally in order to provide some exposure context against which respondents' perceptions of aircraft activity can be understood.
2. As expected, running one survey period immediately after Christmas resulted in a higher proportion of New Zealanders in the sample; there were also more people visiting at this time, compared to the February period. The surveyors also noted the value of having multiple surveyors in place as it facilitated the capture of more visitors in a more systematic fashion and was especially important as many visitors engaged the surveyors in conversation - restricting their ability to approach other visitors - after completing the survey. These verbal exchanges proved invaluable when it came to analysing, understanding and interpreting the data.
3. As noted in the text, due to the quality of the data collected, Question 4 (*What number of aircraft have you noticed on this visit?*) should use 'closed' response options from which respondents can select the appropriate range (eg., 0, 1-9, 10-19, 20-29 etc).
4. Question 6 (*What amount of aircraft would spoil your visit to Westland Tai Poutini National Park?*) should include the option 'no amount would spoil it', as was the case in the 2001-2003 surveys.
5. Data on respondents' past visitation should be added to the monitor (see Table 12).

## References

Anon. (2009). The effects of Aircraft Overflights on recreationists in Westland *Tai Poutini* National Park: A monitoring report. DOCDM-425244.

Booth, K. L., Jones, N. C. & Devlin, P. J. (1997). The effects of aircraft overflights on recreationists in natural settings. Report prepared for Science and Research, Department of Conservation.

Booth, K. L., Jones, N. C. & Devlin, P. J. (1999). Measuring the effects of aircraft overflights on recreationists in natural settings. Department of Conservation Technical Series 18.

Department of Conservation (2006). Visitor monitoring toolkit: Social monitoring Standard Operating Procedure (DOCDM 33609). Department of Conservation, Wellington

Department of Conservation (2012). Partial Review - Factsheet DOCDM-1037747.

## Appendices

### Appendix 1: Survey form

Office use only

Code:

Date:

### 2013 Visitor Survey



Department of Conservation  
*Te Papa Atawhai*

#### VISITOR SURVEY

Thank you for your time. These questions ask about your visit to Westland *Tai Poutini* National Park. Please think about your current visit on this walk when answering all questions.

- 1 What have you liked the most about your visit to Westland *Tai Poutini* National Park?**

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- 2 What have you liked the least about your visit to Westland *Tai Poutini* National Park?**

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**3 Have you noticed any aircraft during this visit?** By aircraft we mean both helicopters and/or aeroplanes.

Yes    ☐ ☐    Aeroplanes  
         ☐ ☐    Helicopters

No    ☐ ☐

If you answered NO to question 3, please stop here. Thank you for your time. If you answered YES to question 3, please continue.

**4 What number of aircraft have you noticed on this visit?**  
Count each aircraft fly-over separately even if it was the same craft.

\_\_\_\_\_

**5 Has the amount of aircraft activity you've noticed on this visit been:**

- <sub>1</sub> ☐ **Less** than what you expected on this visit ☐
- <sub>2</sub> ☐ **More** than you expected ☐
- <sub>3</sub> ☐ About **the same** as you expected ☐
- <sub>4</sub> ☐ You didn't know what to expect ☐

**6 What amount of aircraft activity would spoil your visit to Westland *Tai Poutini* National Park? Please tick only one box.**

- <sub>1</sub> ☐ Any aircraft activity at all would spoil my visit ☐
- <sub>2</sub> ☐ The amount I've noticed this visit  
(my visit has been spoiled) ☐
- <sub>3</sub> ☐ Double the amount I've noticed this visit ☐
- <sub>4</sub> ☐ Five times the amount ☐
- <sub>5</sub> ☐ More than five times the amount ☐

**7**     **How have the aircraft affected you during this visit?** Please tick only one box

- 1 ☐     I enjoyed them     ☐
- 2 ☐     Neutral (I neither enjoyed them     ☐  
nor was I annoyed by them)
- 3 ☐     I was annoyed by them     ☐
- 4 ☐     I don't know     ☐

**If you answered question 7 by ticking option 3, I WAS ANNOYED BY THEM, then please continue answering all the questions on the next two pages.**

**If you ticked 1,2 or 4 – only answer question 10 on the next page.**

**8**     **How much have the aircraft annoyed you?** Please circle the number that best describes your answer.

1	2	3	4	5	6	7
Hardly annoyed at all					Extremely annoyed	

**9**      **How much have the aircraft detracted from your total enjoyment of this visit to Westland *Tai Poutini* National Park?** Please circle the number that best describes your answer.

1            2            3            4            5            6            7

Didn't detract  
at all

Ruined my  
visit

**10**      **Please tell us a little about yourself:**

**Age** (tick ☒ ONE only):

☐<sub>1</sub> ☐ < 19 yrs            ☐<sub>2</sub> ☐ 20-29            ☐<sub>3</sub> ☐ 30-39  
☐<sub>4</sub> ☐ 40-49            ☐<sub>5</sub> ☐ 50-59            ☐<sub>6</sub> ☐ 60+

**Gender:**            ☐<sub>1</sub> Male            ☐<sub>2</sub> Female

**Where do you normally live?:**

☐<sub>1</sub> New Zealand            ☐ ☐<sub>5</sub> USA  
☐<sub>2</sub> Australia            ☐ ☐<sub>6</sub> Other (specify)  
☐<sub>3</sub> UK            ☐ \_\_\_\_\_  
☐<sub>4</sub> Germany            ☐ \_\_\_\_\_

**How many people are in your group?:** \_\_\_\_\_

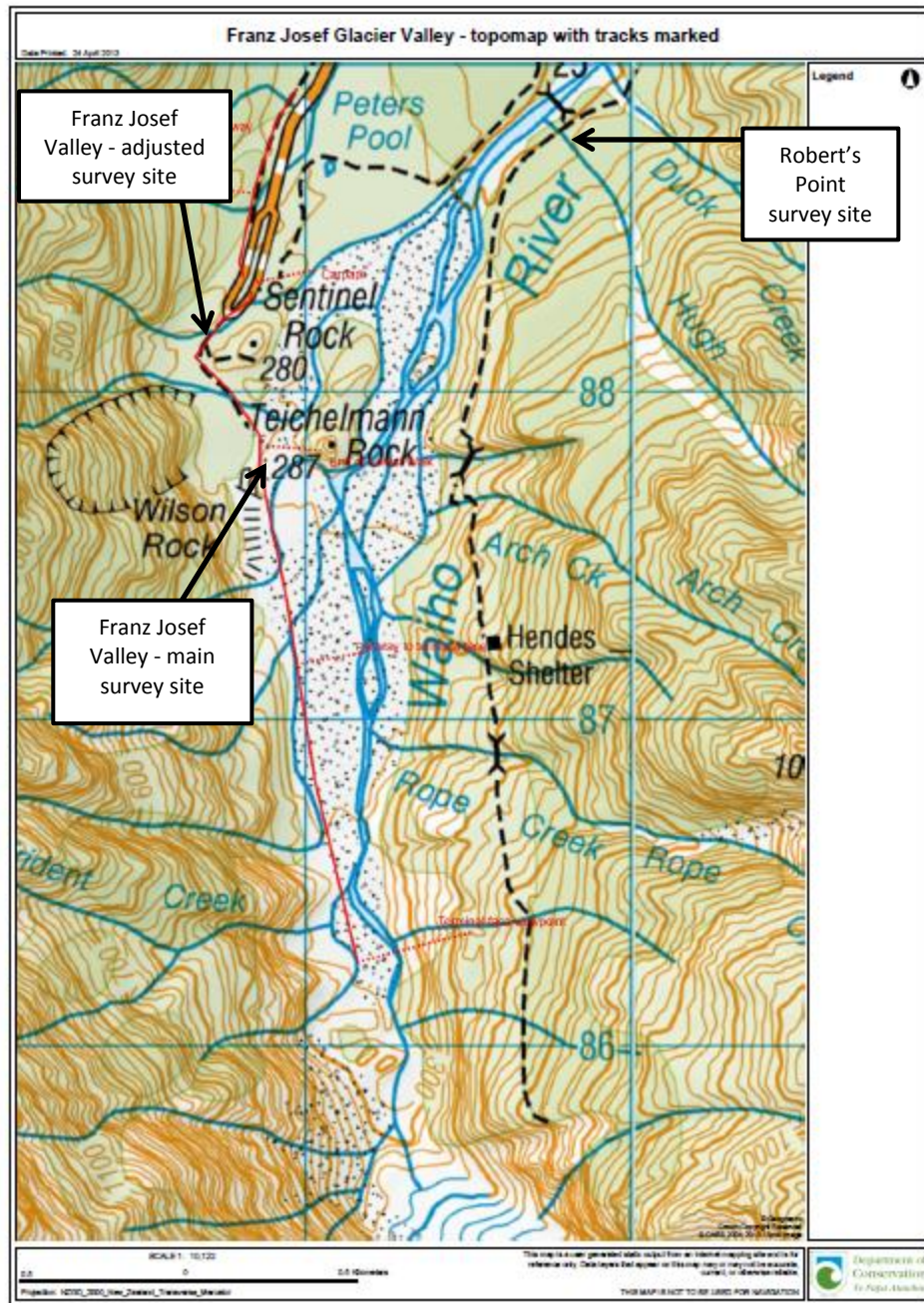
***Thank you for your time!***

**This survey has been funded by the *Westland Aircraft User Group* to help understand the effect of aircraft activity on Park Users**

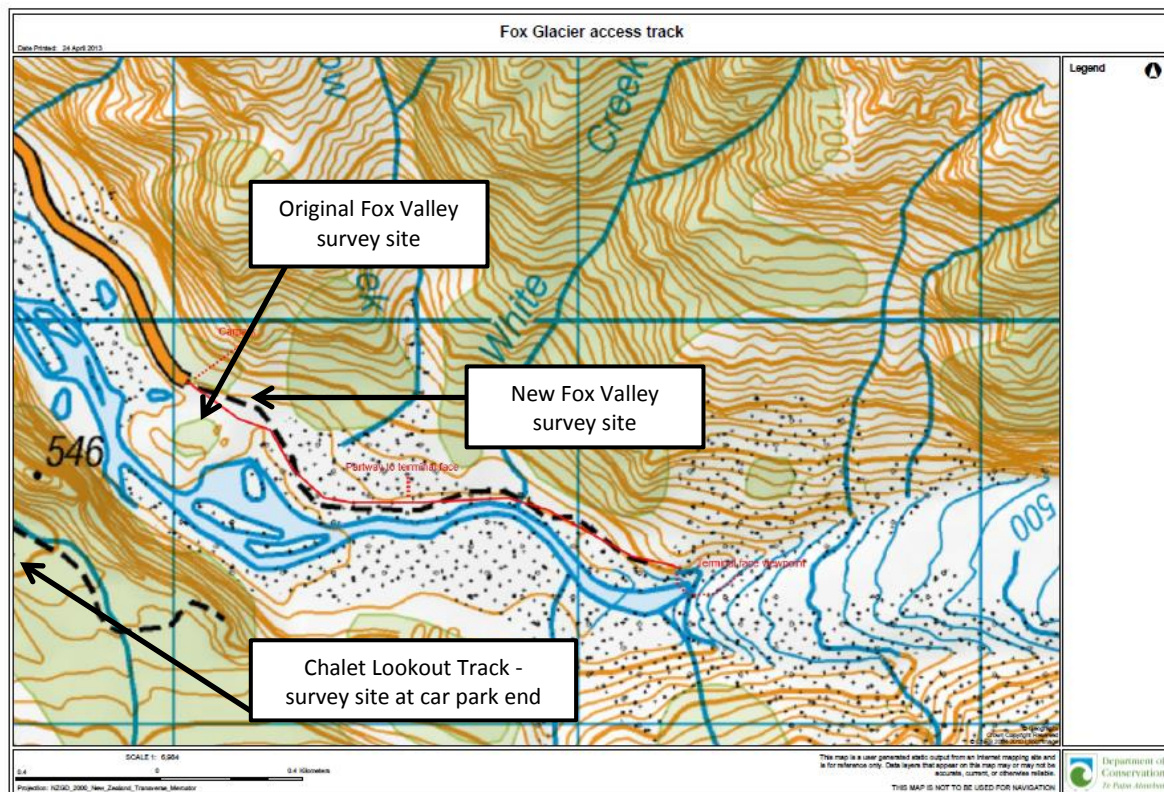
## Appendix 2: Weather conditions

Date	Weather conditions	# Flights
27-Jan	Franz Josef - very clear morning, sunny, light winds, clouded over a bit early afternoon, similar conditions at Fox Glacier	240
28-Jan	High cloud all morning, sunny afternoon but wind picked up in both Franz Josef and Fox Glacier Valleys	236
29-Jan	Raining continuously, some falls very heavy	-
30-Jan	Rain all morning, some heavy falls, clearing around midday but patchy falls throughout afternoon	-
31-Jan	Rain early morning, some clear periods during morning and longer clear periods in afternoon at both Franz Josef and Fox Glacier	6
1-Feb	Very heavy rain all day, thunder, lightning, power cuts in evening at Franz Josef - Franz Josef valley track closed at Forest viewpoint, Fox Glacier valley closed at car park	-
2-Feb	Very heavy rain, lightning, thunder, flooding up valleys, Waiho River very high - Franz Josef valley track closed at Forest viewpoint, no communications in Franz Josef or Fox Glacier from 9.15am (i.e., no landlines, cell, internet, eftpos), increasing frequency and length of power cuts through afternoon and evening, landslide reported on road to Fox Glacier and bridge out at Harihari	-
3-Feb	Clear morning, some cloud during day but stayed mostly sunny, no communications at Franz Josef until early afternoon, Franz Josef valley track open to Forest viewpoint only, Fox Glacier Access Road closed, south side road open to 3pm and only 20 cars at a time, SH6 closed at Harihari	109
4-Feb	Fine morning, some cloud developing around midday, Franz Josef valley track open to Forest viewpoint, Robert's Point track closed, both Fox Glacier roads open but glacier valley track only open for guided walks and Chalet Lookout track closed, SH6 closed	96
17-Feb	Fine but some early high cloud and Franz Josef cloudy all day around tops, clear for part of morning at Fox Glacier but cloudy around tops (increased during afternoon), new glacier viewpoint open at Fox Glacier	138
18-Feb	Warm and dry but still significant cloud at Franz Josef (assumed same at Fox Glacier)	28
19-Feb	Clear morning at Franz Josef and remained clear all day, Fox Glacier clouded over until 11am, some cloud at Fox Glacier early-afternoon but cleared again by 3.30pm	217
20-Feb	Good weather all day	170
21-Feb	Good weather all day, hot	152
22-Feb	Sunny, warm, clear all day	144
23-Feb	Cloud at Franz Josef in morning, conditions at Fox Glacier unknown	75
24-Feb	Sunny, clear morning at Franz Josef, similar at Fox Glacier but clouded over around tops around midday	138
25-Feb	Sunny morning, clouded over around midday but still bright, very warm	124

### Appendix 3: Maps showing survey sites







## Appendix 4: Flight record sheet

### Daily Flight Record

Date:

Company:

Time (take off)	Duration (minutes)	Flight Path (Select 1, 2, 3, 4 or 5)	Purpose (Select 1, 2, 3, 4 or 5)

#### Flight Path:

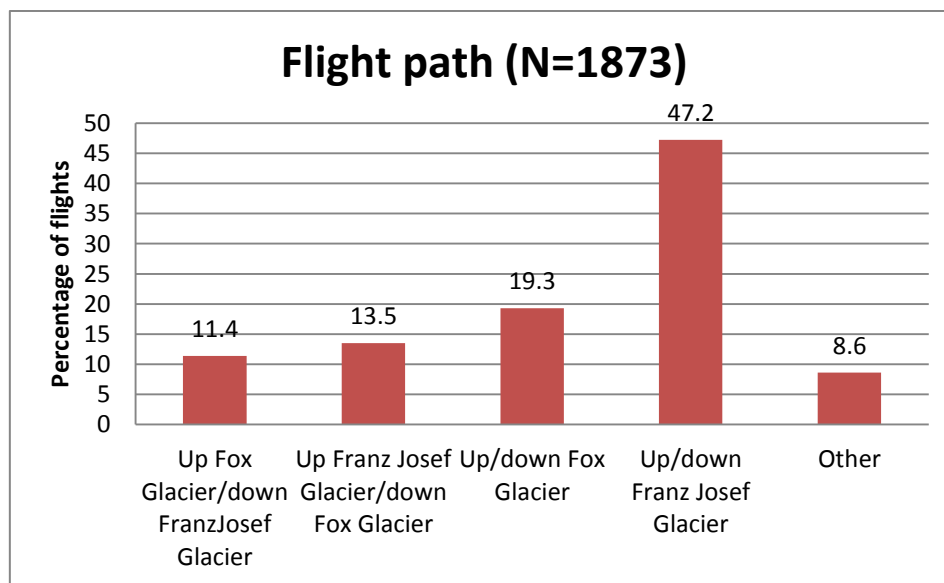
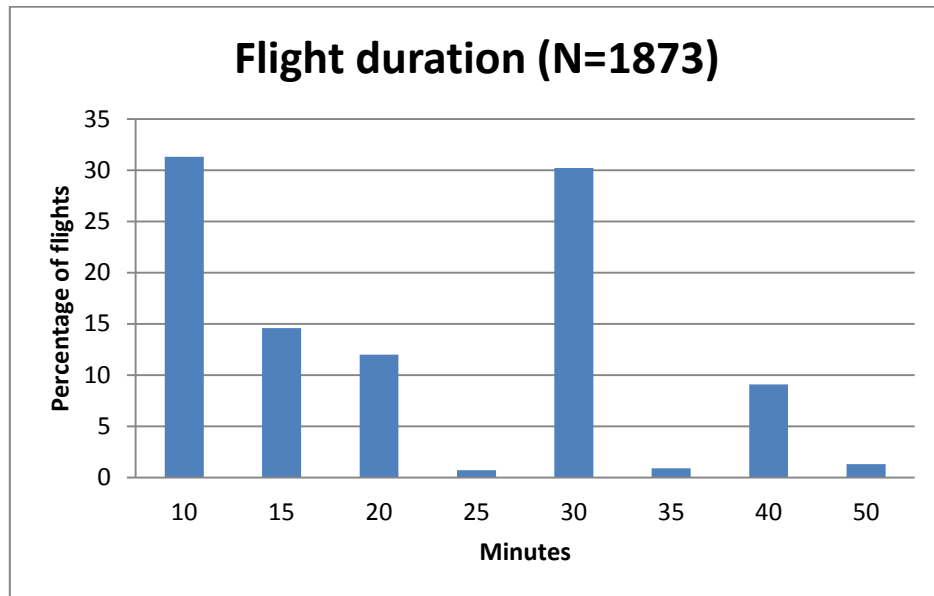
- 1 – up the Fox Glacier, down the Franz Josef Glacier
- 2 – up the Franz Josef Glacier, down the Fox Glacier
- 3 – up and down the Fox Glacier
- 4 – up and down the Franz Josef Glacier
- 5 – other (specify flight path)

#### Purpose:

- 1 – Scenic flight with snow landing
- 2 – Scenic flight with NO snow landing
- 3 – Helihike – Victoria Flat/Luncheon Rock
- 4 – Ice Explorer
- 5 – Other

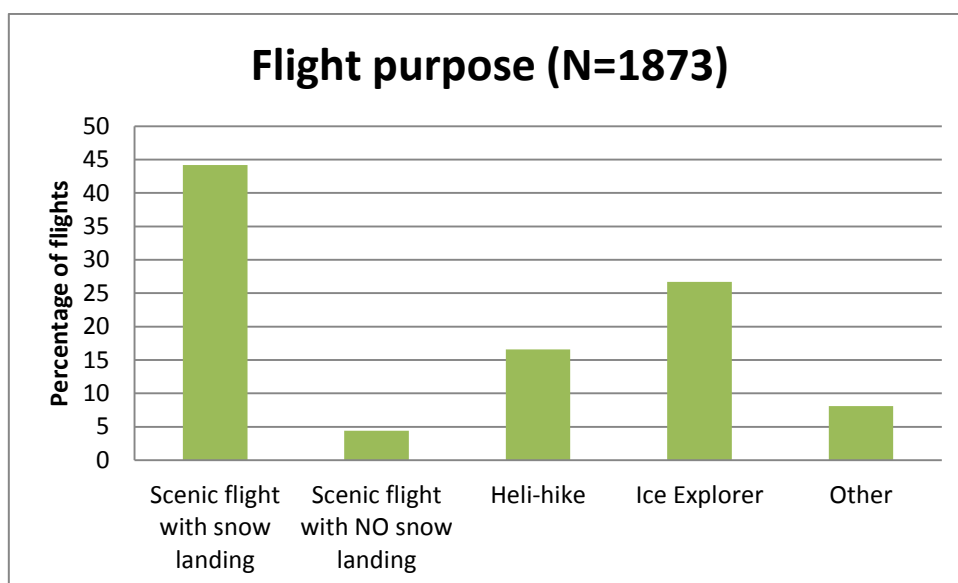


## Appendix 5: Flight details



Flight Path 'Other' (N= 162) included:

- Sky dive flights from Fox Glacier (N=80)
- Sky dive flights from Franz Josef (N=44)
- Scenic flights from Fox Glacier that went high to Middleton Glacier and returned via Fox Glacier (N=22) - recoded for Fox Glacier flight to be included in flight calculations
- Scenic flight over other valleys (N=15)
- Flight from Franz Josef to Lake Tekapo (N=1)



Flight purpose 'Other' (N= 152) included:

- Sky dive flights Fox Glacier (N= 80)
- Sky dive flights Franz Josef (N=44)
- Climbers (N=20), one of which was a Medivac
- Charter flight (N=1)
- Service flight (N=1)
- Unknown purpose (N=6)

## Appendix 6: Sample details (N=1192)

Date	Franz Josef Valley	Robert's Point	Fox Glacier Valley	Chalet Lookout	
27-Dec	70	21	60	20	Survey Period 1
28-Dec	50	20	100	30	
29-Dec	-	-	-	-	
30-Dec	-	-	-	-	
31-Dec	-	-	-	-	
1-Jan	-	-	-	-	
2-Jan	-	-	-	-	
3-Jan	44	-	-	-	
4-Jan	41	-	-	-	
17-Feb	55	-	90	23	Survey Period 2
18-Feb	-	-	-	-	
19-Feb	93	-	52	4	
20-Feb	37	-	72	23	
21-Feb	25	-	-	-	
22-Feb	66	-	-	11	
23-Feb	24	-	-	-	
24-Feb	1	-	80	10	
25-Feb	70	-	-	-	
Total Surveys	576	41	454	121	

## Appendix 7: Full list of countries of residence

	Country of residence	Number of respondents (N=1168)
Australasia & Oceania	New Zealand	204
	Australia	164
	Tahiti	1
Europe	UK	211
	Germany	170
	Netherlands	47
	France	44
	Switzerland	27
	Denmark	21
	Czech Republic	14
	Austria	14
	Spain	14
	Sweden	9
	Ireland	8
	Italy	7
	Finland	4
	Estonia	3
	Luxemburg	3
	Belgium	2
	Andorra	2
	Slovenia	2
	Channel Islands	2
	Norway	1
	Slovakia	1
	Greece	1
	Poland	1
	Lithuania	1
Americas	USA	94
	Canada	32
	Brazil	7
	Chile	4
	Argentina	1
	Mexico	1
Asia	China	15
	India	7
	Singapore	4
	Malaysia	3
	Taiwan	3
	Hong Kong	2
	Korea	1
	Indonesia	1
Middle East & Africa	Israel	9
	South Africa	3
	United Arab Emirates	1
	Unspecified	2

## Appendix 8: Coding for ‘most liked’ aspects of visit

### 1. Natural environment

Nature, ancient fern forest, clean air, fresh air, streams, bush, weather, moss, river, rainforest, geological features, rocks, water, peacefulness, waterfalls, greenness, animals and birds, ferns, flora, water, environment, clean, mountains, big cliffs, lake, birdsong, quietness, no rain

### 2. Glacier related

General glacier walks, being close to glaciers, seeing at close range, Fox Glacier, Franz Josef Glacier, free access, views of Fox, views of Franz, FJ Valley walk, FJ ice cave, easy access, free walking, not too many people, hearing ice cracking, wow effect of seeing glacier, learning about glacier history, clearly marked warning signs

### 3. Facilities & activities

Challenging walking tracks, tracks in general, Roberts Point track, Lake Matheson, Chalet Lookout, well built & maintained tracks, good infrastructure, the range of tracks, exploring rocks, river crossings, option of easy walks, general facilities, walks well-mapped, car parks, free parking, helicopter flight, walk on glacier, looking for gold with pan and shovel, safety signage, info boards, safe, can get up close to nature, well maintained, the town, hot pools, history guide on signs, ice climbing, information of glacier history at i-site, the area is not overdeveloped, Gillespie’s Beach, Peters Pool, Copeland Track, walking on ice without a tour, safe tracks, forest walkway, natural DOC campgrounds

### 4. Overall scenic amenity

Beautiful, sunset, wilderness, open space, unspoilt New Zealand, neatness, landscape, mountains, scenery, viewing spots, views, view from Chalet lookout, highway views, humbling feeling, pollution free, scenic road, sightseeing, photogenic, emptiness

### 5. Other

Lack of crowds, everything, different to home, empty roads, being with family, contrast to up north, village doesn’t have big hotels, overall fantasticness, friendly people with smiles, talking with DOC worker, exercise, friendly locals, nothing much

## Appendix 9: Coding for 'least liked' aspect of visit

### 1. Aircraft

Helicopters, helicopter noise, aircraft, planes, wanted to do heli-hike, wanted to do scenic flight, heli-hike cancelled, heli-hike queue, no window seat in helicopter, price of heli-hike, heli-hike booked out, endless helicopter noise

### 2. Glacier experience

Other tourists, commercial-ness, limited access, glacier, too small, too dirty, long walk to FJ, not able to get close enough to FJ, gross toilets, repetitious safety signs, uneven surface, no rubbish bins, narrow tracks, no hidden places, no pub at FJG, fact that it is receding, ineffective signs and barriers at glacier face, crowds, no toilet at Chalet lookout, Roberts Point is an out and back track, lack of interpretation on Roberts Point walk, misleading walk times, took too much time, Fox guided tour, lack of flora interpretation, speed bumps made of rock, lack of escalators, pathways not overly authentic, leaf blowers, restricted access (track closure) due to flood waters, roads, guided trips crowd paths, lack of good marking for FX view road turnoff, many people ignoring safety barrier, FJ glacier not like in photos, FJ glacier seems better in advertising, Roberts Point track closed, no soap in the toilets, no options for glacier trek for experienced people, no drinking water facilities, lack of toilet at end glacier walk, lack of shade, no internet in glacier valley, dislike concept of people being on a delicate glacier, unsealed car park, climb at end of Fox Valley track, attitude of guides to independent people walking on ice, no picnic tables at carpark

### 3. Nothing

Nothing, all good, N/A, no, none (only coded if something actually written to this effect on form - i.e. not if left blank)

### 4. Westland NP experience

Not enough walk tour options, lack of camping facilities, high prices, Top 10 HP FJ, high price of accommodation in FJ, lack of ATMs, people driving in the middle of the road, fuel prices, toilets at DOC campground, Lake Matheson, the driving, difficult and long drive, distance, traffic, food, price of attractions not advertised until very late, telephones down, road closed, couldn't do many activities due to storm, being stuck at Franz, bridge smashed, lack of campervan overnight parking, FJ DOC campground too far out of town, attitude of tourists, tourism, Jackson's Bay, only short walks, incorrect spelling on sign in Franz (sanctuary spelt wrong), no radio, the Scenic Hotel, 1080 drops, unhelpful man in FJ i-site, weather forecast/information, want more DOC campgrounds, behaviour of other tourists, no interpretative sign naming peaks at Lake Matheson, tours in general, RMA, surveys, more signs generally, rubbish, motel room

### 5. Natural environment

Sandflies, slippery stones at Roberts Point, stream crossing, bugs, sun too hot, rocks, no sun, flooding, blackbirds, a kea eating boot

