

# Visitor satisfactions, impact perceptions, and attitudes toward management options on the Travers-Sabine Circuit Track

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## Great Walks visitor research programme

This report is the tenth derived from the Great Walks visitor research programme. Reports from surveys of other tracks are published through the same series. While data in this report were collected predominantly during January–February 1994, the visitor responses still provide valid indications of visit experiences and evaluations. Any significant management or use-pattern changes since 1994 can be interpreted in the light of these results. The main changes on the Travers–Sabine Circuit Track have been an increase in capacity of the main huts from 16 to 35 bunks, removal of some smaller huts, and some track realignment and boardwalking. Management reports indicate that use-levels have been increasing at a small, but steady rate.

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# Abstract

Walkers on the Travers-Sabine Circuit Track in Nelson Lakes National Park were surveyed in January-February 1994 as part of a wider study of track users in New Zealand. Their visit evaluations were highly positive, suggesting little dissatisfaction or any need for urgent management action. Other results indicated that further improvements to visit quality would be best achieved through improving the use of space in huts. Perceptions of crowding were low, but assessment of social and physical impacts indicated that visit-experience problems would gradually emerge with future increase in use-levels, particularly due to impacts from greater hut congestion. Visitors favoured information-based management to address these increasing use-pressures rather than more regulatory controls. New Zealand visitors were generally more opposed to management controls than were overseas visitors. Current low perceptions of crowding suggest that time may be available for information-based approaches to be applied to achieve long-term control, without more direct measures being required at present.

# Executive summary

This report summarises key results from a 1994 survey of 237 walkers on the Travers-Sabine Circuit Track. The survey was undertaken to complement results of a broader study of people doing overnight trips on tracks managed as Great Walks. It provides information about visitor satisfactions with their visit experiences, about which aspects of visits may be detracting from the quality of these experiences, and about management options to address these issues.

## **Evaluation**

Evaluations of the visit were very positive. Overall satisfaction scores were very high, and few visitors considered the experience was in any way below their expectations. However the overall satisfaction measure was not linked to any other variables in the survey, which limits its practical value as a possible tool for any monitoring of visit experience quality. Low crowding perceptions indicated visit experiences were not being substantially compromised, but were found to have some association with impact perceptions related to hut congestion. In general, crowding scores appear to represent a more sensitive measure of compromises to visit-experiences.

## **Satisfaction with facilities and services**

Satisfactions with specific facilities and services were high, and no substantial sources of dissatisfaction were apparent. There were no links between these specific satisfactions and overall evaluations of the visit. While satisfaction scores did not highlight any important issues, the significant differences identified between the satisfactions of different visitor groupings did highlight some issues relating to crowding perceptions (uncrowded/crowded) and age-group (under 40/over 40 years). In summary, crowded visitors were more dissatisfied with hut conditions and information services; and older visitors who felt crowded were distinctly more dissatisfied with hut conditions than were other visitors. While quite simplified summaries of complex results, these points highlight satisfactions with hut conditions as being particularly variable, and most notable differences in satisfactions if visitors felt crowded. However, these differences occurred in a context of very high satisfaction levels. This suggests no immediate need for significant management interventions. Should use pressures increase, hut space and facility capacity of huts appear the main areas where attention may first be required.

## **Impact perceptions**

Most visitors did not notice any social and physical impacts. Only the specific impacts of uncertain water hygiene and track widening by trampling were noticed by more than 50% of visitors. The only impacts bothering more than 20% of visitors were related to track trampling and littering. Any compromises to the quality of current visit experience appear likely to be related only to these physical impacts. Overall, these impact perceptions do not indicate any priority need for current management action.

While overall perceptions highlighted physical impact issues, the significant differences identified between the perceptions of different visitor groupings highlighted issues relating to crowding (uncrowded/crowded). In summary, crowded visitors were significantly more bothered by impact perceptions related to hut/track congestion. This related to seeing too many people in huts and on the track; seeing too many big groups; experiencing noise in huts; experiencing insufficient bunk numbers; and having to rush for bunks at the next hut. While these negative perceptions of hut congestion impacts were not notably high overall, they were linked with greater perceptions of crowding. These results indicate that any detrimental effects on visit experiences will arise first among the perceptions of social congestion associated with increasing pressure on hut conditions. These survey results also emphasise that management actions to minimise any future compromises to visit-experience quality should focus first on hut conditions, as should any related monitoring.

### **Attitudes toward management options**

Visitors were most positive toward the use of information to encourage better choices of trip timing and appropriate behaviour on them. Attitudes were generally split over options involving encouraging alternative types of visits and accommodation (e.g., camping, guided trips, new tracks). A large majority of visitors were highly negative toward options of rationing or manipulating-use to channel or reduce visitor numbers (e.g., booking systems, permits, peak pricing, one-way walk, reduce facilities), and toward development of options to increase accommodation capacity of huts (e.g., more huts, more bunks in huts).

While overall visitor attitudes favoured information management options, significant differences were identified between the attitudes toward management of different visitor groupings. Issues highlighted related to nationality (New Zealand/overseas), crowding perception (uncrowded/crowded), and age-group (under and over 40 years). In summary, New Zealand visitors were more opposed to providing alternative options and rationing/manipulating-use; crowded New Zealand visitors were more opposed to information management, while crowded Overseas visitors were more supportive of rationing/manipulating-use; older New Zealand visitors were more opposed to providing alternative options, while older Overseas visitors were more supportive. These quite simplified summaries of complex results highlight the visitor groupings where attitudes to management options were most variable and extreme.

### **Recommendations**

While there was no urgent need for immediate management action to address current problems, the most productive areas for preventative action to minimise future compromises to the quality of visit experiences appear to be:

- Optimising/increasing acceptable facility capacity and bunk capacity of huts
- Optimising/reconfiguring the use of space for comfort and facility use in huts
- Provision of general information about the features of the Travers-Sabine, and for planning visits to it (possibly emphasising maps and brochures)
- Provision of information approaches which forecast visitor numbers and hut loadings in advance, accompanied by suggestions on visit timing and operation to minimise 'crowded' experiences.

Most initial gains should be made by concentrating upon short-term physical changes to hut facilities and their operation, complemented by more long-term promotion of beneficial changes through information approaches. Appropriate research and information back-up could include:

- Identifying visitor preferences for facility, bunk, and space standards in huts
- Assessing options for optimising the use of space and facilities in huts
- Assessing the effectiveness of information-based techniques in influencing visitor use
- Investigating differences in the expectations and evaluations of visits by different visitor groups, particularly relating to hut conditions and congestion
- Investigating the greater perception of social hut congestion impacts by crowded visitors
- Investigating the distinction between noticing and tolerating impacts, and being bothered by them
- Investigating the more negative visitor attitudes to direct management options, particularly by New Zealand visitors
- With reference to any insights from the investigations above, evaluate the outcomes of different management options on visit experiences and visit patterns on the Travers-Sabine Circuit Track.

Any monitoring of visit experience quality should concentrate first upon hut congestion conditions at key huts. Emphasis should be on a variety of approaches, as simple measures of overall satisfaction are unlikely to provide a useful means to monitor changes in these conditions. Some assessment and periodic monitoring of activity patterns and facility loadings should be undertaken on the Travers-Sabine Circuit and its related tracks.

## Acknowledgements

The overall Great Walks study covered a wide variety of different track and recreation situations, and raised a number of large operational and analytical challenges. Help and advice on statistical approaches to these analyses was provided at various times by Margaret O'Brien and Ian West of Science & Research Unit, Department of Conservation, and Roger Wilkinson of Landcare Research. Data entry for the project was carried out very effectively by the Tourism Green project team of Michael Chan, Victor Keo and Sulia Aumua. Ian Mackenzie of Science & Research Unit provided the editorial assistance for final production of the reports. Thanks are also due to other Departmental staff who viewed the draft reports and made useful suggestions on their overall approach and contents.

For the Travers-Sabine survey, overall co-ordination was managed by Brendon Clough of Nelson/Marlborough Conservancy, Department of Conservation, with staff from St Arnaud Visitor Centre co-ordinating field operations. The actual application of the survey in the field was carried out by Barnaby Hill as part of the Tourism Green project team.

# 1. Introduction

The Travers-Sabine Circuit uses a network of forest-valley and alpine tracks in and around the Travers and Sabine Valleys in Nelson Lakes National Park. This survey was undertaken as part of a broader study of people doing overnight trips on the Great Walks. While not currently managed as a Great Walk, the Travers-Sabine Circuit is a popular backcountry walking area which could be considered for such management status. It was included in the overall study to provide a contrast of a relatively popular track outside of, but similar to those in the more formally managed Great Walks system. Tracks classified and managed as Great Walks are the primary locations for multi-day walking trips in the New Zealand backcountry. They are of high scenic and recreational value, and are characterised by high and increasing use-levels. This use pressure, and the need to provide for quality outdoor recreation experiences, requires that these tracks be specifically managed to provide high levels of facility and service provision without compromising the quality of the visit experience. To achieve this outcome, managers require information about visitor satisfactions with their visit experiences, and what aspects of visits may be detracting from these experiences. On this basis, the objectives of the Travers-Sabine Circuit component of the Great Walks study were to:

- Provide brief description of overnight visitors to tracks similar to the Great Walks
- Identify visitor satisfactions with the facilities and services provided
- Identify visitor perceptions of crowding and use-impacts
- Identify visitor attitudes towards management options

Departmental staff at key huts administered standardised questionnaires to visitors on each track<sup>1</sup> on their last trip night. Overall, 237 Travers-Sabine Circuit visitors completed the survey questionnaire during the 1993/94 summer season. After data coding and entry, preliminary results were initially presented to managers as percentage tables. These descriptive results are summarised here in the questionnaire format (refer Appendix 1).

Other analyses were carried out on the database, and this report summarises the main findings derived from these descriptive and analytical results. The report presents overall evaluations by visitors of their visit experiences, and then investigates the specific aspects of facility and services satisfactions, social and physical impact perceptions, and attitudes toward different management options. Analyses are undertaken which assess how these specific responses vary between different groups of visitors, and how they relate to the overall evaluations. This approach enables any significant current or potential compromises to the quality of visit experiences to be clearly identified.

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<sup>1</sup> A standardised questionnaire (Appendix 1) was developed for overnight walkers on the Great Walks system (Abel Tasman, Heaphy, Kepler, Milford, Rakiura, Routeburn, Tongariro, and Waikaremona tracks), and the Whanganui River journey. Surveys of the Travers-Sabine and Dart-Rees track circuits were also included, although flooding prevented any survey work being done on the latter. A sample of sea-kayakers was also collected in Abel Tasman National Park. German and Japanese translations were provided.

## 2. Visitor information

In summary, visitor characteristics were representative of a young and international group of people, largely unfamiliar with the Travers-Sabine Circuit and generally inexperienced at the backcountry walking activity. Short hut-based trips predominated. Some summary findings included: (refer Appendix 1 for details)

- A majority of males (62%) compared with females (38%)
- Only 45% were from New Zealand, compared with 17% German, 11% British, 8% Australian
- Most (71%) were aged between 20–40 years, only 8% were aged 50 or more
- Most (86%) were on a first visit to the track, 8% were on their first overnight walking trip, 28% had done from 1 to 5 similar walks, and 19% had done more than 20 such trips
- Group sizes averaged just under 3 people
- Trip durations were varied, with 40% of visitors on trips of 1 or 2 nights, while another 40% were on trips of 5 or more nights
- Many (53%) stayed only in huts, many others (27%) used a combination of huts and campsites, and the remainder (17%) used only campsites.

New Zealand visitors represented a broader age-range, came on longer trips, and had more previous experience of the Travers-Sabine Circuit and of overnight walks in general. Overseas visitors were more often in the 20–40 year age-range (82% *vs* 57% for New Zealand visitors), had fewer visit nights (mean of 3.4 *vs* 3.8 for New Zealand visitors), were more often on first-visits to the track (97% *vs* 73% for New Zealand visitors) and done fewer overnight walks (23% had done 20 or more tracks *vs* 49% for New Zealand visitors).

Comparisons were also made of the characteristics of visitors who indicated they were either ‘crowded’ or ‘uncrowded’. (Refer to Section 3.2 and Appendix 3 for descriptive discussion of this crowding distinction.) However, the only notable differences were the larger group sizes of those who were crowded (means 3.51 *vs* 2.56), and their slightly greater experience of doing similar types of walks (mean score 3.93 *vs* 3.46). While neither group had greater previous experience of the Travers-Sabine Circuit, the difference in numbers of similar walks done suggests that the crowded visitors may be more experienced. However, this difference is slight and no conclusions can be drawn from these results. Overall, the crowded and uncrowded visitors could not be distinguished from each other on the basis of their descriptive characteristics.

Comparisons were also made between the characteristics of visitors who indicated they were either mainly hut users or campsite users. However, no notable differences were apparent in the characteristics of these visitors.

# 3. Evaluation of the quality of visit experiences

Overall evaluation of the quality of visit experiences was assessed through four questions related to overall satisfaction and perceptions of use-levels (refer Appendix 1 for question details).

## 3.1 EVALUATION OF OVERALL SATISFACTION

Two questions allowed visitors to evaluate the quality of their overall visit experiences:

- An *overall satisfaction* score (how satisfied or dissatisfied with the trip—Question 5)
- An *expectation fulfilment* score (was the trip better or worse than expected—Question 4)

Positive responses from visitors to these questions represented their evaluation that they had achieved high quality recreation experiences on their visit. Figures 1 and 2 show that satisfaction on the Travers-Sabine Circuit (and other tracks) was very high (94%), and most experiences were as good as had been expected, or better (93%). While these responses were similar in degree, they were only weakly correlated with each other ( $r = 0.38$ ). These responses were consistent with those from other tracks. Virtually nobody indicated they were dissatisfied with their trip. The main conclusion drawn from these overall evaluations is that visitors are achieving quality experiences on the Travers-Sabine Circuit that are frequently better than they expected.

Figure 1. Overall satisfaction.

Figure 2. Fulfilment of trip experience expectations.

### 3.2 EVALUATION OF USE-LEVELS

Two further questions allowed visitors to evaluate the quality of their visit experiences in relation to use-levels:

- A score for perception of *crowding* (overall, did they feel crowded on the trip—Question 2)
- An evaluation of *expected visitor numbers* (seeing more/same/less than expected—Question 3)

Positive responses from visitors indicating low levels of crowding, and not seeing more people than expected, would have reinforced overall evaluations of achieving high quality visit experiences. However, Figures 3 and 4 show that crowding perceptions were not great, and that few visitors saw more others than they expected. These crowding and expected use-level evaluations were weakly correlated with each other ( $r = .39$ ), indicating those who experienced higher use-levels than they expected generally tended to have higher crowding scores<sup>2</sup>. Levels of reported crowding were much lower on the Travers-Sabine Circuit (43%) than on other tracks (61%).

Other questions asked were aimed at identifying any focal points for crowding perceptions on the Travers-Sabine Circuit (Question 3). Overall, 62% of visitors ( $n = 141$ ) indicated that some places were more crowded than others, and of these visitors, 93% included hut sites in their examples while only 6% included track sections. Appendix 1 summarises other crowding information from Question 3, which indicates that visitors who indicated some focus for hut crowding ( $n = 130$ ) specified Angelus Hut (51%) and Lake Head Hut (14%). These results indicated issues related to hut use were the key to crowding perceptions, with track issues not apparent.

Figure 3. Crowding perception summary.

Figure 4. Fulfilment of visitor number expectations.

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<sup>2</sup> In addition, an ANOVA test ( $F(2,212) = 19.34$ , signif.  $F = .000$ ) showed mean crowding scores increased from those expecting more people (1.79), through those expecting the numbers seen (3.00), to those expecting fewer people (4.02). Similar analyses found no significant differences between use-level expectations and overall satisfaction mean scores.

These low crowding perceptions could be interpreted as representing use-levels which are only at 'low normal conditions' (refer Appendix 3), suggesting there is not a problem with perceptions of excessive use-levels at this time. These low crowding scores were not significantly linked with overall satisfaction. In other words, lower crowding perceptions were not associated with higher evaluations of satisfaction with the trip, or it being considered better than expected. While only a minority of visitors indicated they did experience crowding, and many experienced lower use-levels than they expected, this did not appear to affect how they felt about their overall trip. These low crowding and high satisfaction evaluations suggest that the quality of visit-experiences is not being compromised by conditions associated with current use-levels (refer Appendix 3). Subsequent sections in this report present analyses which indicate where future compromises may occur in relation to satisfactions with particular facilities and services (refer Section 4.2), or with perceptions of particular social and physical impacts (refer Section 5.2).

FIGURE 5. SATISFACTIONS WITH THE FACILITIES AND SERVICES PROVIDED (N = 237).

## 4. Satisfaction with facilities and services

Satisfaction with 28 specific facility and service items were surveyed, covering aspects of the tracks, huts, campsites, and information services provided (refer Appendix 1, Question 7). The complete list of responses, summarised in Figure 5, shows very high satisfaction levels, and there were few expressions of dissatisfaction. Only dissatisfaction with signposts showing distances/times (20%), and track drainage (17%), exceeded the 15% dissatisfaction level. In many cases, responses were also highly neutral, indicating the facility or service was not present, or not considered important. The >40% who were neutral toward hut lighting, campsite washing, cooking and shelter facilities, and the gentle track slopes provide examples. Overall, these results indicate a high acceptance of the existing standards of services and facilities, and by inference, may be indicative of little demand for any additional provision.

### 4.1 EFFECTS OF AGE, GENDER, NATIONALITY, AND CROWDING PERCEPTION

#### 4.1.1 Background to analyses

Additional analyses were required to assess whether these satisfactions varied significantly according to age group, gender, nationality and crowding perception. Because it was apparent that patterns of visitor responses were often similar across particular groups or ‘clumps’ of these satisfaction items, summary scales of these ‘clumps’ had to be constructed to allow valid statistical analyses. The resulting satisfaction scales, each containing items which had related response patterns, are listed in Table 1 and shown in Figure 6 (next page).

TABLE 1. SUMMARY SCALES FOR SATISFACTIONS WITH FACILITIES AND SERVICES (REFER APPENDIX 2).

SCALES	DESCRIPTIONS
Hut conditions	Hut and facility space, bunk numbers, water/toilet/other facilities, heating, lighting, relaxation space
Track conditions	Boardwalks, steps, smooth/easy/gentle track surfaces, drainage of water, track marking, distance/time signs, bridges
Information services	Map/brochure quality, visitor centre information/advice, information signs map information in huts, advice from wardens
Campsite conditions	Campsite space, water/toilet/other facilities

FIGURE 6. SATISFACTION RESPONSES ORDERED IN SUMMARY SCALE STRUCTURE.  
THIS IS SIMPLY A RE-ORGANISATION OF MATERIAL PRESENTED IN FIGURE 5.

#### 4.1.2 Significant findings

Using the SPSS MANOVA routine, a series of multivariate analyses of variance were carried out on these satisfaction scales (e.g., the dependent variables). Differences in satisfaction scales according to age-group (under and over 40 years), gender (male/female), nationality (New Zealand/overseas), and crowding perception (uncrowded/crowded) were analysed. The same approach was subsequently used for impact perception (Section 5.1) and management attitude (Section 6.1) scales. The significant effects and interactions associated with the analysis using these independent variables are summarised in Table 2. These results indicate that satisfaction with hut conditions and information services are particularly important for management attention.

To minimise a data constraint associated with missing values, satisfaction analyses excluded those not using huts (17%). Additional analyses indicated no notable results were compromised by this exclusion, with no significant differences in satisfaction results for campsite users.

TABLE 2. SIGNIFICANT EFFECTS ON SATISFACTION SCALES (HUT USERS ONLY).

SOURCE OF SIGNIFICANT EFFECT*	SIGNIFICANT SATISFACTION SCALES†	MEAN VALUES (ADJUSTED)‡		
			Uncrowded	Crowded
Crowded effect $F(3,218) = 5.01, p = .002$	Hut conditions $F(1,220) = 13.33, p = .000$		2.04	2.26
	Information services $F(1,220) = 7.24, p = .008$		1.92	2.10
Crowded/Age interaction $F(3,218) = 4.32, p = .006$	Hut conditions $F(1,220) = 6.34, p = .012$	Under 40	2.07	2.21
		Over 40	1.94	2.43

\* The significance of overall satisfaction effects was tested using the Wilks' criterion in the SPSS MANOVA.

† A series of univariate ANOVAs in the MANOVA identified the contribution of each satisfaction scale to the overall significant effect, and identified these listed scales as being significant.

‡ Mean values for the summary scales are divided by the number of constituent items to give a interpreted using the original question categories (e.g., 1 = Very satisfied 3 = Neutral 5 = Very dissatisfied)

#### ***Crowded effect***

Crowded visitors were significantly less satisfied than uncrowded visitors with facilities and services. This difference was based most upon their lower satisfactions with hut conditions, and to a lesser extent information services. However, this finding must be seen in context of the generally high levels of satisfaction, where their mean scores remain within the 'satisfied' category. This means that crowded visitors were really only less strongly satisfied rather than being more dissatisfied. Additional exploration<sup>3</sup> of the hut conditions scale (refer Figure 6) indicated that the crowded visitors were particularly less

<sup>3</sup> Comparison of response to the dependent variable, for each item comprising the significant scales, was carried out mainly using the Mann-Whitney test. This provided a conservative test to identify the items which appeared to contribute most to the overall effect. Multiple ANOVA tests were also run which supported Mann-Whitney test findings. This complementary approach was applied to the constituents of all significant scales identified in this report.

satisfied with the hut facilities for drying, washing, and toilets, the number of bunks in huts, and the space for relaxing in huts. Additional exploration of the information services scale indicated crowded visitors were particularly less satisfied with the quality of maps and brochures, and the map/brochure information in huts.

#### ***Crowded/Age-group interaction***

This significant interaction, based most on satisfactions with hut conditions, featured lower satisfaction among crowded visitors in general, but this was particularly more negative among the crowded visitors who were older. Additional exploration of the 'hut conditions' scale, which contributed most to this interaction, featured toilets facilities and space/facilities for drying gear as the most prominent items where older crowded visitors were less satisfied. Among uncrowded visitors, the older ones were relatively more satisfied. These results suggest the perception of crowding is a more negative influence on the experiences of older visitors.

## **4.2 RELATING SATISFACTION SCALES TO OVERALL TRIP EVALUATIONS**

None of the satisfaction scales were significantly associated with the overall satisfaction or use-level evaluations (e.g., crowding). No notable correlations or significant relationships (using SPSS Multiple Regressions) were found. The state of facilities and services experienced on the Travers-Sabine Circuit did not appear to contribute at all to how the overall trip was evaluated. In particular, the lack of any notable relationships between overall satisfaction and any of the facility and service satisfaction scales indicates these questions represent distinctly different visitor perspectives on visit satisfaction. This is an important distinction to acknowledge as simply applying a single overall evaluation of satisfaction appears unlikely to highlight any specific-issue satisfaction problems until they are of an order where visit quality may be already highly compromised, and the problems are more difficult to manage.

FIGURE 7. IMPACT PERCEPTION RESPONSES (N = 237).

## 5. Visitor perceptions of impacts

Perceptions of 26 specific impact items were surveyed, covering social impacts, physical impacts, and impacts associated with the facilities and services (refer Appendix 1, Question 5). Visitors were asked to respond to each item using the options of not experiencing the impact, experiencing it but not being bothered, being bothered a little, and being bothered a lot. The complete list of responses, as summarised in Figure 7 (and Figure 8), shows that in the main most visitors did not experience most of these impacts. This may be because the impacts did not occur, or because they were not noticed by the visitor.

The most prominent impacts reported here are indicated through combining the responses of those who were 'bothered' by impacts, and those who simply 'noticed' them. These 'impact aware' responses often represented a majority of the visitors. The main examples of these more prominent impacts, which were apparent to almost half the visitors, included: uncertain water hygiene (63%), track trampling/widening (60%), seeing too many in huts (49%), track trampling/shortcuts (44%), and over-development of huts (40%). These were the most prominent impacts noticed on the Travers-Sabine Circuit, although it should be remembered that there is a clear distinction between the impacts being noticed and tolerated, and being seen as negative. What contributes to the progression from 'noticing and tolerating' an impact, to 'becoming bothered by it' (e.g., it becomes negative) represents an important question for future research.

The most negative impacts, representing those which most 'bothered' the visitors, appear to emphasise physical impact perceptions associated with water hygiene, litter and track damage. The most prominent of these was 'uncertain water hygiene', which bothered almost half (43%) of the visitors. It was a response to the statement 'uncertainty about the water always being safe to drink.' From consultations with managers, it can be concluded that this response most often represents general caution about water quality, rather than being a direct reaction to hygiene problems experienced on the visit. It was not clear if this caution was related to all water sources on the trip, or just those in trackside streams. Litter around huts (25%) and on the track (21%) bothered many visitors, while trampling damage leading to track widening (30%) and formation of shortcuts (21%) was also prominent. The only other impact to bother over 20% of visitors was a perception of inadequate toilet facilities (21%). Social impact issues were not prominent among those specifically bothering visitors.

When visitors did notice impacts, many were not bothered by them. This response could be considered 'tolerance' of the impacts. For example, while 49% of visitors noticed seeing too many in huts, only 18% were bothered by it. The remaining 31% noticed the impact, but were not bothered by it (e.g., indicating tolerance). It is clear from Figure 8 that many other impacts were noticed, but were tolerated, including, for example, 'too much development of huts,' which was noticed by 40% of visitors, of whom most were not bothered by it (29% *vs* 11% bothered). However, when most of those noticing an impact

were bothered by it, it could be considered to show high ‘intolerance’ and unacceptability of the impact source. From Figure 7, impacts indicative of inappropriate behaviour by others appeared least acceptable to visitors (also see Figure 8). The main example is seeing litter on the track, where 23% noticed the impact, but only 2% were not bothered by it. Other examples include littering of huts, seeing toilet paper and waste, and woodcutting damage. However, while these appear to represent the least acceptable types of impacts, they were not highly reported here.

## 5.1 EFFECTS OF AGE, GENDER, NATIONALITY, AND CROWDING PERCEPTION

### 5.1.1 Background to analyses

Additional analyses were required to assess whether these impact perceptions varied significantly according to age group, gender, nationality, and crowding perception. Table 3 and Figure 8 show the impact perception scales which were created for these analyses (refer Section 4.1.1).

TABLE 3. SUMMARY SCALES FOR SOCIAL AND PHYSICAL IMPACT PERCEPTIONS (REFER APPENDIX 2).

SCALES	DESCRIPTIONS
Seeing litter	Litter at huts, campsites, on track
Physical damage	Waste/toilet paper, vegetation damage, track trampling/damage
Hut/track congestion	Insufficient bunks, too many in huts/on track, hut noise, rush for bunks, big groups
Over-development	Excessive level of huts, tracks, signs
Campsite congestion	Too many people, noise, rush for campsites, guided groups
Water/toilet/hygiene	Inadequate water supply, water hygiene doubts, campsite wear

(extra individual items— plane noise)

FIGURE 8. IMPACT PERCEPTION RESPONSES ORDERED IN SUMMARY SCALE STRUCTURE.

### 5.1.2 Significant findings

Differences in these impact scales according to age-group (over and under 40 years), gender (male/female), nationality (New Zealand and overseas), and crowding perception (Uncrowded/Crowded) were analysed (refer Section 4.1 for method). The significant effects and interactions associated with the analysis using these independent variables are summarised in Table 4, where the mean values show that while the perceptions of impact were not high (means <2), some differences were apparent between the different groups.

TABLE 4. SIGNIFICANT EFFECTS ON IMPACT SCALES.

SOURCE OF SIGNIFICANT EFFECT	SIGNIFICANT IMPACT SCALES	MEAN VALUES (ADJUSTED)*	
		Uncrowded	Crowded
Crowded effect <i>F(6,196) = 4.21, p = .001</i>	Hut/track congestion <i>F(1,201) = 19.29, p = .000</i>	1.21	1.68

\* Mean values for the summary scales are divided by the number of constituent items to give a interpreted using the original question categories (e.g., 1 = Not noticed 2 = Not bothered 3 = Bothered a little 4 = Bothered a lot).

#### ***Crowded effect***

Visitors who felt crowded had higher perceptions of hut/track congestion impacts. Additional exploration of the hut congestion scale indicated that crowded visitors perceived greater levels of all the impact items. The most prominent impact items perceived more negatively by crowded visitor were seeing too many in huts and seeing too many big groups. Perceptions of insufficient bunk space and seeing too many on the track each day were of secondary importance. Perceptions of hut noise and having to rush for bunks in huts were also greater among crowded visitors, although to a lesser extent. No other types of impact perceptions were significantly different between crowded and uncrowded visitors.

## 5.2 RELATING IMPACT PERCEPTION SCALES TO OVERALL TRIP EVALUATIONS

None of these impact scales were statistically associated with overall satisfaction, indicating that no specific social or physical impact perceptions were related to how the trip was evaluated. However, significant associations were found between impact perceptions and the overall crowding evaluation. An SPSS multiple regression ( $F(2,219) = 47.21$ , signif.  $F = .0000$ ) identified an association (adjusted  $r^2 = .294$ ) between the impact scales (independent) and crowding (dependent). The hut/track congestion scale ( $\beta = .476$ ,  $t = 8.22$ ,  $p = .0000$ ) and over-development scale ( $\beta = .186$ ,  $t = 3.22$ ,  $p = .0015$ ) were the most important predictors of crowding. That is, being more bothered by the social impacts from hut/track congestion and over-development was weakly associated with feeling more crowded. This interpretation was supported by the

moderate correlations between crowding and both hut/track congestion ( $r = .51$ ) and over-development issues ( $r = .29$ ).

The most important individual items correlated with crowding from the hut/track congestion scale were 'seeing too many big groups' ( $r = .43$ ), 'insufficient bunks in huts' ( $r = .39$ ) and 'seeing too many in the hut' ( $r = .38$ ). The most important individual item correlated with crowding from the over-development scale was 'over-development of signs' ( $r = .40$ ) and 'over-development of huts' ( $r = .27$ ). The prominence of these individual items emphasises the importance of social impacts to crowding perceptions.

FIGURE 9. MANAGEMENT PREFERENCE RESPONSES (N = 237).

## 6. Visitor attitudes towards management options

Attitudes toward 18 options for managing future increases in track use-levels were surveyed, with visitors indicating the degree to which they agreed or disagreed. These options included increasing the capacity of accommodation, dispersing use pressures, imposing use-limits, and providing pre-walk information (refer Appendix 1, Question 8). The complete list of responses, as summarised in Figure 9, indicates a variety of visitor attitudes.

The only management approach which attracted consistently high support was that associated with using pre-walk information to influence visitor choices about making track visits. Around 70% of visitors agreed with these approaches while less than 5% disagreed. Disagreement was much higher with the more direct control methods such as making the track one-way, reducing facilities and services in order to discourage use, making peak times cost more for visits, or applying track booking or permit systems. Over 70% of visitors disagreed with these. Development options such as building more huts, providing more bunks in huts, or allowing more guided trip opportunities were also unpopular, with over 50% of visitors disagreeing with these. For many of the other options, the proportions of visitors either for or against were more even. For example, the options related to increasing camping options or promoting alternative tracks received similar degrees of positive and negative response.

Overall these results indicate a pattern of preferences by visitors for different management options (also refer Table 5 and Figure 10). Indirect information-based approaches are clearly most favoured by almost all visitors. 'Providing alternative opportunities for undertaking walking activity' tended to split visitors more evenly for or against. More direct action to control and channel use or to develop more accommodation options/facilities were clearly least favoured.

## 6.1 EFFECTS OF AGE, GENDER, NATIONALITY, AND CROWDING PERCEPTION

### 6.1.1 Background to analyses

Additional analyses were required to assess whether these management items varied significantly among visitors according to age group, gender, nationality, and crowding perception. Table 5 and Figure 10 (overleaf) show the scales of attitudes to management options created for these analyses (refer Section 4.1.1).

TABLE 5. ATTITUDES TO MANAGEMENT SUMMARY SCALES (REFER APPENDIX 2).

SCALE	DESCRIPTION
Rationing/manipulate use	Hut/camp booking systems, limited permits, facility reduction, high peak costs, one-way track
Information management	Encourage use elsewhere, promote low-impact behaviour
More hut capacity	More hut/camp capacity, guided options
Alternative options	Cheap alternatives, other tracks, small groups, camping freedom, guided options

### 6.1.2 Significant findings

Differences in these management scales according to age-group (over and under 40 years), gender (male/female), nationality (New Zealand and overseas), and crowding perception (uncrowded/crowded) were analysed (see Section 4.1 for method). Significant effects and interactions associated with the analysis using these independent variables are summarised in Table 6. These results indicate significant differences in attitudes toward management options do occur according to interactions between nationality, age-group, and crowded perception.

TABLE 6. SIGNIFICANT EFFECTS ON ATTITUDE TO MANAGEMENT SCALES.

SOURCE OF SIGNIFICANT EFFECT	SIGNIFICANT ATTITUDE SCALES	MEAN VALUES (ADJUSTED)*		
			New Zealand	Overseas
Nationality effect $F(4,200) = 4.58, p = .001$	Alternative options $F(1,203) = 12.68, p = .000$		3.24	3.00
	Rationing/manipulate use $F(1,203) = 6.73, p = .010$		3.79	3.53
Nationality/Crowded interaction $F(4,200) = 3.91, p = .004$	Information management $F(1,203) = 6.87, p = .009$	Uncrowded	New Zealand 2.01	Overseas 1.87
		Crowded	1.77	2.02
	Ration/manipulate use $F(1,203) = 5.77, p = .017$	Uncrowded	New Zealand 3.72	Overseas 3.64
		Crowded	3.89	3.37
Nationality/Age interaction $F(4,200) = 2.63, p = .035$	Alternative options $F(1,203) = 7.23, p = .008$	New Zealand	Overseas	
		Under 40	3.17	3.04
		Over 40	3.35	2.74

\* Mean values for the summary scales are divided by the number of constituent items to give a interpreted using the original question categories (e.g., 1 = Strongly agree 3 = Neutral 5 = Strongly disagree).

FIGURE 10. ATTITUDE TO MANAGEMENT RESPONSES IN SUMMARY SCALE STRUCTURE.

### ***Nationality effect***

New Zealand and overseas visitors had significantly different attitudes towards management options to cope with increased use-levels. New Zealand visitors were more negative toward controlling use-levels by promoting alternative tracks and facilities, and by rationing use and manipulating-use conditions. Conversely, overseas visitors were relatively more positive toward these management options. These results indicate New Zealand visitors are more opposed to management options that require visit controls or promotion and development of alternatives on the track.

Exploration of the 'alternative options' scale indicated that New Zealand were particularly more opposed to allowing options of more guided trips using separate facilities. There was much less difference with overseas visitors toward providing more alternative tracks and encouraging camping options. Exploration of the 'ration/manipulate use' scale indicated that New Zealand visitors disagreed particularly more with the options of requiring permits to do the track, and having booking systems for huts. Overall, these results suggest a more general resistance among New Zealand visitors towards options that appeared reduce visit freedom or were perceived to represent 'commercial recreation' possibilities.

### ***Nationality/Crowded interaction***

A significant interaction between nationality and crowded perception was based largely on attitudes to the management options of information management and rationing/manipulating use.

For the options of using information to manage use, the attitudes of uncrowded New Zealand visitors were more negative than those of uncrowded overseas visitors. However, when feeling crowded, New Zealand visitors tended to agree more with using direct information management, while overseas visitors tended to agree less. Additional exploration of the information management scale indicated that this interaction was apparent only for the direct options of providing information on suitable alternatives, and providing information on crowding conditions to enable informed visitor choices.

For the options of rationing/manipulating use, the attitudes of New Zealand and overseas visitors who felt uncrowded were similar. However, when feeling crowded, New Zealand visitors disagreed a little more with these options while overseas visitors disagreed considerably less. Additional exploration of the rationing/manipulating use scale indicated that this interaction was most apparent for making peak times more expensive, and requiring permits or booking systems.

Overall, these results may suggest that when feeling crowded, overseas visitors consider information approaches to be of less value than direct use-controls, while New Zealand visitors become more aware of a need for management and favour information approaches for this.

### ***Nationality/Age-group interaction***

A significant interaction between nationality and age-group was based largely on attitudes toward the management option of alternative options (e.g., new tracks, more camping options, guided options, cheaper alternatives). The

attitudes were very similar between younger New Zealand and overseas visitors, but among older visitors the attitudes of New Zealand visitors were a little more negative while those of overseas visitors were considerably more positive. The attitudes of older New Zealanders were most negative towards these alternative options, while older overseas visitors were most positive. Additional exploration of the 'alternative options' scale highlighted providing new tracks as representing the main difference, while providing more camping opportunities was of secondary importance. These results suggest that older overseas visitors appear most likely to favour development of alternative types of opportunities to deal with any increases in use pressures. Conversely, older New Zealand visitors appear most likely to be resistant to such changes.

### ***Extreme responses***

Because visitors attitudes were sometimes substantially split either for or against the management options (refer Figure 10), additional exploration of these data were undertaken. The top and bottom 25% of scores for each of the management option scales were selected, representing the more 'extreme' attitudes of those who most strongly agreed or disagreed with the options. Differences were apparent according to gender, age-group, nationality, and crowding perceptions. Females with these extreme attitudes towards management options were more positive than males toward rationing/manipulating use (63% *vs* 48%). Younger visitors (under 40 years) were more positive than older visitors toward rationing/manipulating use (54% *vs* 42%), but less positive toward using information management (48% *vs* 62%). New Zealand visitors with these extreme attitudes were more negative than overseas visitors towards rationing/manipulating use (59% *vs* 38%) and promoting alternatives (69% *vs* 48%), but were more positive than overseas visitors toward providing more hut capacity (36% *vs* 24%). Crowded visitors with extreme attitudes were more positive than uncrowded visitors toward options of promoting alternatives (59% *vs* 39%) and providing more hut capacity (37% *vs* 25%).

## **6.2 RELATING MANAGEMENT PREFERENCE SCALES TO OVERALL TRIP EVALUATIONS**

There were no significant links between the overall visit evaluations (e.g., satisfaction and crowding), and any scales of the attitudes towards management options. These results suggest that preferences for different management options were unaffected by any experiences on the track visit.

# 7. Summary and discussion

## 7.1 OVERALL VISIT EVALUATIONS

Overall levels of dissatisfaction were negligible, and very few considered the experience was below their expectations. In addition, perceptions of crowding were at low levels and few visitors saw more others than they expected. These findings suggest that no major use-level issues were apparent on the Travers-Sabine Circuit at the time of the survey, and visitors were having highly positive visit-experiences.

Some caution is required when interpreting these satisfaction findings, particularly as most visitors to the Travers-Sabine Circuit are on a first visit. There is a tendency for such visitors to give approval to the status-quo of social and environmental conditions they experience on a visit. They usually lack previous experience of the site, and any strong expectations as to what might constitute the appropriate and acceptable conditions which occur there. In a situation of changing use over time, the overall satisfaction of such visitors can remain consistently high despite considerable changes in visit experience. Those first-time visitors with strong, but inaccurate, expectations of social and physical conditions, or repeat-visitors with expectations based on previous conditions, are most likely to indicate overall dissatisfaction. These types of visitors are usually also most likely to be displaced to different sites, times, or activities, and are more likely to give negative feedback about their experiences to others. However, other visitors may recognise that elements of the visit-experience may not be what they would prefer, but are prepared to rationalise some of their preferences in the interests of an enjoyable overall visit. All these considerations suggest that reliance on overall satisfaction measures as a monitor of visit-experience quality can be misplaced. However, should considerable levels of dissatisfaction feature in such measures, it is likely that major problems are already well-established; clearly this was not the case on the Travers-Sabine Circuit.

## 7.2 SATISFACTION WITH FACILITIES AND SERVICES

No notable levels of dissatisfaction were apparent for any of the facilities and services on the Travers-Sabine Circuit. The high level of satisfaction across all the facility and service types indicated a lack of any specific visitor problems with track management infrastructure, and suggested there was no immediate need for management intervention beyond normal maintenance. The only concerns which may possibly require some consideration related to dissatisfaction with distance/time signs along the track, and track drainage. However, these were only minor sources of dissatisfaction (around 15%) and do not appear to warrant high priority on the basis of satisfaction levels alone.

While overall satisfaction scores did not highlight any important satisfaction issues, the significant differences identified between the satisfaction of different visitor groupings did highlight some issues relating to crowding perceptions (uncrowded/crowded) and age-group (under 40/over 40 years). In summary, crowded visitors were more dissatisfied with hut conditions and information services, and older visitors who felt crowded were particularly more dissatisfied with hut conditions. While quite simplified, these summary points highlight hut conditions as an area where satisfaction levels were particularly variable.

Satisfaction with hut conditions was notably lower among crowded visitors, and also among those older visitors who felt crowded. In each case, these lower satisfaction levels emphasised space in huts for relaxing, facilities and space in huts for washing-up and drying gear, and toilet facilities. Satisfaction with the number of bunks in huts was also notably lower among crowded visitors. While some competition for bunks was apparent, and toilet issues were also prominent, these results suggest that the relatively greater dissatisfactions of crowded (and older crowded) visitors were also substantially related to how the space and facilities in huts were being used. The basic management and research question to be addressed on this issue is how huts might be reconfigured to optimise the use of hut space. Given the likely increases in use levels and ageing of visitor groups in the future, these issues assume some priority.

Satisfaction with information services was also notably lower among crowded visitors, particularly with regard to maps and brochures in general, and availability in the huts. These findings may reflect an underlying information need associated with finding crowded conditions, although this is not addressed by these results. If improvements to information services are given priority in the future, these results indicate that some focus on information needs related to influencing visitor expectations of crowding may be appropriate.

Overall, these findings suggest that while overall levels of satisfaction with facilities and services were high, hut conditions related to relaxation space and facility access will become a more prominent issue in situations where higher use-levels are anticipated. It appears that these will represent the first areas where compromises to the quality of visit experiences may occur. However, the relatively lower scores for these satisfaction scales occur within a context of high satisfaction levels, suggesting that these are currently not priority issues of serious dissatisfaction.

### 7.3 PERCEPTIONS OF IMPACTS

Visitors were most bothered by perceptions of various physical impacts. These were based most upon perceptions of littering, track damage, and uncertain water hygiene. Perceptions of 'uncertain water hygiene' were most negative, bothering 43% of visitors. However, it was not apparent that this perception represented any actual conditions experienced on the track. Perceptions of 'littering around huts' and 'on the track' each bothered around 20% of visitors. Perceptions of 'trampling impacts' which widened tracks and created shortcuts also bothered over 20% of visitors. And 21% of visitors were bothered by

perceptions of inadequate toilet facilities. Negative perceptions of social impacts related to hut and track congestion were not prominent, nor were any other types of impacts. Overall, these results do not indicate any major visitor concerns which require management priority.

Many visitors were aware of other impacts such as seeing too many in huts, and perceived over-development of huts, tracks, and signs. But these visitors were more often tolerant of these impacts rather than being bothered by them. Understanding the distinction between simply noticing these impacts and being specifically bothered by them appears an important research issue. Visitors also appeared to have very little tolerance of particular types of impacts which very visibly represent inappropriate behaviour (e.g., seeing litter, toilet paper/waste, and woodcutting). While these were not prominent impacts overall, they do suggest particular visitor sensitivity to such 'inappropriate' behaviour in natural settings.

While overall impact perceptions highlighted physical impact issues, the significant differences identified between the impact perceptions of different visitor groupings highlighted issues relating to crowding perceptions (uncrowded/crowded). In summary, crowded visitors were significantly more bothered by all impact perceptions related to hut/track congestion. This related to seeing too many people in huts and on the track; seeing too many big groups; experiencing noise in huts; experiencing insufficient bunk numbers; and having to rush for bunks at the next hut. Crowded visitors were more bothered by each of these social impacts. While the negative perceptions of these social hut congestion impacts were not notably high overall, they were linked with greater perceptions of crowding. If, as a result of greater use, crowding perceptions increase in future, it is likely that any compromises to the quality of visit-experiences will first become apparent among the perceptions of hut congestion.

#### 7.4 ATTITUDES TOWARD MANAGEMENT OPTIONS

When considering management options for addressing future increases in visitor use-levels, most visitors were highly positive toward information management. That is, the strategic use of information to better match visitor expectations with likely experiences, and to give prospective visitors a better basis to choose visit timing and locations that better suit their preferred visit experiences. This may be a particularly important component of any general improvements undertaken in visitor information services. These results indicated clearly that such information management approaches were considered most preferable among all types of visitors. The main question this poses for managers is whether such information management approaches represent an effective tool of practical value. This is an area where additional investigation should be encouraged, as it offers the possibility of developing management approaches with much higher degrees of visitor (and public) support.

A large majority of visitors were highly negative toward options of rationing, or manipulating use to channel or reduce visitor numbers (e.g., booking systems, permits, peak pricing, one-way walk, reduce facilities); and toward increased

accommodation capacity of huts (e.g., more huts, more bunks in huts). The strength of apparent opposition to these options indicates that considerable background research and consultation with visitor-groups will be necessary before they could be implemented ahead of the more acceptable options. Booking systems for huts (and campsites), which have been considered as management options for controlling visitor numbers on many of the Great Walks, were opposed by around 60% of visitors overall. The proportion of visitors in favour of booking systems was around 20%, while the remaining 20% were neutral. These analyses do not provide any explanation of these negative attitudes, but it appears that specific investigation of visitor attitudes towards such control of their visit freedom would be appropriate.

The significant differences in attitudes toward management options which were identified between different visitor groupings highlighted issues relating to nationality (New Zealand/overseas), crowding perception (uncrowded/crowded), and age-group (under and over 40 years). In summary, New Zealand visitors were more opposed to management options of providing alternatives and rationing/manipulating use; crowded New Zealand visitors were more opposed to information management, while crowded overseas visitors were more supportive of rationing/manipulating-use; older New Zealand visitors were more opposed to providing alternative options, while older overseas visitors were more supportive. While this is a quite simplified summary of complex interactions, these points highlight areas where attitudes to management options were most variable.

Differences in attitudes toward management options between New Zealand and overseas visitors highlighted different visitor attitudes toward promoting alternatives and rationing/manipulating use. In both cases, New Zealand visitors were more opposed to management. While opposition to both these types of options was high overall, and was particularly so for rationing/manipulating use, these results indicate the main visitor grouping where this opposition is particularly acute (e.g., New Zealanders). Among the options for promoting alternatives, attitudes toward 'allowing more guided opportunities' most reflected this difference. Among the options for rationing/manipulating use, attitudes toward 'permits and booking systems' most reflected this difference. In both cases, New Zealand visitors appeared distinctly more opposed, suggesting a more general resistance to management controls and compromises to perceived freedom in their recreation.

Differences in attitudes toward management options, identified through the interaction of nationality and crowding perception, featured different visitor attitudes toward information management and rationing/manipulating-use. New Zealand visitors who felt crowded were distinctly more supportive of information management options, particularly the more direct applications of information on alternative possibilities and projections of crowding conditions. Overseas visitors who felt crowded were distinctly more supportive of rationing/manipulating use options, particularly making peak times more expensive and requiring permits or booking systems. Overall, when feeling crowded, overseas visitors appear more supportive of direct management controls. New Zealand visitors appear more aware of some need for management intervention, but are more inclined to favour information-based

approaches rather than more direct management actions. Given the very high overall levels of support apparent for the information-based options, they should be applied whenever possible. However, should more direct actions be considered necessary, the attitudes of New Zealand visitors will require particular consideration.

Differences in attitudes toward management options identified through the interaction of nationality and age-group featured visitor attitudes towards options for promoting alternative sites or accommodation types (e.g., new tracks, camping options, guided options, cheaper options). While the attitudes of younger visitors were similar, older overseas visitors were distinctly more supportive of promoting alternatives, while older New Zealand visitors were distinctly less supportive. These differences were most pronounced for providing new tracks and allowing more camping options, and indicate that the distinctions between the attitudes of New Zealand and overseas visitors are more pronounced in the older age-group. Should promotion of alternative options be considered for managing increasing use-levels, this distinction may require some investigation, particularly since overall visitor attitudes toward the options of promoting alternatives tended to be more evenly split either for or against.

These represent a complex series of interactions, but they highlight that combinations of crowded, New Zealand, and older visitors appeared generally more opposed to most management options. Conversely, these results also suggest that combinations of uncrowded, overseas, and younger visitors appeared to be generally more supportive of most management options. Examination of the extreme positive and negative attitudes to these management options generally reinforced the more negative attitudes of New Zealand visitors toward rationing/manipulating use and promoting alternatives. They indicated that overseas visitors appeared more opposed to options of increasing hut numbers and capacity, and suggested that negative attitudes toward some management options were lower among crowded visitors. Overall these results highlight the more 'management-resistant' sectors among the visitor groupings, and identify some visitor-groupings where the negative attitudes towards some management options are more variable. These results suggest where further investigations may be required to help minimise conflicts arising from any proposed management changes.

## 7.5 CONCLUSIONS AND RECOMMENDATIONS

While there were no urgent needs for immediate management actions to address current problems, visitor responses indicated that there were current effects on visit experiences from the presence and behaviour of other visitors. These effects were mainly associated with hut congestion, and general perceptions of crowding. While these effects appeared to be largely tolerated (many visitors indicating they were not bothered by them), the results linking crowding with perceptions of hut/track congestion impacts indicated some of these evaluations would become more negative at higher use-levels. Overall these results indicated that preventative action to minimise future compromises to the

quality of visit-experiences will need to be considered, particularly with regard to hut conditions, but that these are not critical at present. If management control is required, visitors indicated a preference for such actions to be based most upon information use to guide visitor choices, rather than any more direct regulation/manipulation approaches to limit or channel visitor opportunities. Initially some development of long-term information approaches could be undertaken, as stringent controls do not yet appear essential. However, New Zealanders were less supportive of management in general, and any proposed actions would need to allow for the effects on their perceived sense of recreational freedom. In summary, the main management actions which could be undertaken include:

- Optimising/increasing the facility capacity and bunk capacity of huts to standards more acceptable to visitors, but subject to management requirements
- Optimising the use of hut space for relaxation and for access to facilities within and around the huts
- Provision of general information about the features of the Travers-Sabine, and for planning visits to it (possibly emphasising map and brochure information sources)
- Provision of information approaches which forecast visitor numbers and hut loadings in advance: indicating where and at what times 'on-track bottlenecks' are most likely; outlining what alternative trip patterns may be followed; and providing general suggestions on visit timing and organisation to minimise any 'crowded' visit experiences

Most initial gains should be made by concentrating upon making whatever simple improvements are possible in the use of space in huts. This may involve initiating investigations of visitor preferences for the standards of facilities, bunks and space in huts. The latter information options require generating behavioural change among the visitors rather than the physical changes to hut facilities and their operation. Promoting beneficial behavioural changes through information use represents a more long term approach, will be based largely on pre-visit information, and may require greater involvement with external agencies. Any consideration of these approaches will require additional investigations in a number of areas to assess the potential effectiveness of information use as a practical management tool. Although specific facility and service dissatisfactions were not prominent, future investigation of the facility and service expectations of different visitor groups should be considered, particularly emphasising hut conditions, perceptions of littering and track damage, and expectations of time/distance information signs. Results from investigations carried out in more pressured track settings may contribute here.

More regulatory management options were not highly favoured, and do not appear to be necessary in the short term. However, given the possibility of such options being considered in the future, additional investigations should be encouraged to explore the reasons for the largely negative visitor attitudes toward management options (particularly among New Zealanders), and the extent to which perceived freedom from external controls is an element of preferred recreation experiences. Due to the low levels of crowding and impact

perception, such investigations need not be carried out specifically in relation to the Travers–Sabine Circuit Track.

Monitoring of the quality of visit experiences should not rely on overall visit satisfaction scores. Crowding scores offer a more sensitive overall measure. Any specific monitoring of visit-experience quality should concentrate first upon hut congestion conditions at key huts. For the Travers–Sabine Circuit, this could initially concentrate upon visitor experiences at Angelus Hut, although if other key bottlenecks become apparent at smaller huts, then these should be subsequently included. Some additional investigation of the different trip patterns on the Travers–Sabine Circuit may be appropriate. Any monitoring should address wider elements of hut congestion conditions that simply bunk occupancy. Reference to the visit-experience expectations of visitors should be included in the process of developing any monitoring options for the Travers–Sabine Circuit.

# Appendix 1

## **Summary of Travers–Sabine questionnaire responses**

This presents the basic response percentages for the questions asked in the survey. These percentages are presented in the format of the original questionnaire, although some lists of responses are attached where their format is incompatible with this approach. Where appropriate, some distinction is also made between the responses of hut and campsite users (at least 1 night).

## ATTACHED QUESTIONNAIRE RESPONSES

These responses are presented here as they do not fit with the questionnaire format used for this appendix.

### A. Question 1. Nationality breakdown

NATIONALITY	NO'S	%
New Zealand	111	45
Germany	39	17
Great Britain	27	11
United States	19	8
Australia	20	8
Switzerland	0	0
Netherlands	3	1
Canada	1	0
Denmark	4	2
Israel	7	3
Japan	0	0
Other Europe*	6	3
Other Asia	0	0
Other	0	0

\* 3 France, 3 Sweden

### B. Question 1. Nights on trip and at huts/camps

(i) Trip Duration

No. of nights	1 nights	2 nights	3 nights	4 nights	5+ nights
% trips of this duration	21	19	20	10	40

(ii) Nights at Huts and/or Campsites

#### Overnight accommodation

	Huts only	Hut & 1 camp	Multiple huts/camps	Camps & 1 hut	Camps only
% trips	53	7	16	4	17

### C. Question 3. Locations of crowding focus

Overall, (62%) of visitors (n = 141) considered some places on the visit were more crowded than others. They were asked to indicate in general terms whether this occurred in huts, at campsites, on the track or elsewhere, and then relative to these, specifically where. These specific responses are summarised here. Note that multiple responses were allowed for.

**Huts** — 130 specified huts as a focus of crowding (93% of 141). Of these, the specific focus responses highlighted the following main sites (wide diversity of sites named, most small capacity huts (4-8 bunks):

51% — Angelus Hut                      14% — Lake Head Hut  
 9% each — for Coldwater, John Tait, and West Sabine Huts

**Campsites** — 0 specified campsites as a focus of crowding (0% of 131).

**On the track** — 9 specified areas along the track as a focus of crowding (6% of 131). Of these, the specific focus responses highlighted the following main sites: N/A (low freq.)

**Other** — 0 specified 'other' areas as a focus of crowding (0% of 131).

# Appendix 2

## Details of Travers–Sabine principal components analysis

Principal component analysis (PCA) was carried out upon selected subsets of response-list items from 237 respondents to the Travers-Sabine Circuit sample. These subsets related to response lists for visitor perceptions of impacts (Q.5), visitor satisfactions (Q.7), and visitor preferences for possible management responses (Q.8) to increasing visitor numbers. The PCA defined a reduced number of summary scales which could then be used for more complex analytical procedures. The following material describes the summary scales, and demonstrates the degree to which they are representative of their component variables. Items were included in the scale if their removal reduced the value of the scale reliability co-efficient (Kronbachs alpha).

### SATISFACTION SCALES (from Question 7)

SCALE NAME (and description)	RELIABILITY (Kronbachs Alpha)	COMPONENT LIST VARIABLES (from original questionnaire)	LOADINGS (from PCA) Q. 7 lists)
Hut conditions	0.8976	Hut washing up space/facilities Hut drying space/facilities Water supply at huts Space to relax in huts Number of bunks in huts Hut cooking space/facilities Toilets at huts Hut heating facilities Hut lighting facilities	0.827 0.735 0.722 0.718 0.705 0.703 0.687 0.530 0.419
Track conditions	0.8270	Smooth/easy surfaces Gentle slopes/not steep Distance/time signs Steps Boardwalks over wet/fragile areas Track marking Bridges over rivers Drainage of water	0.781 0.711 0.679 0.612 0.595 0.572 0.548 0.437
Information services	0.8324	Material from visitor centres Advice from visitor centres Quality of maps/brochures Advice from wardens Maps/brochures in the huts Information signs by the track	0.811 0.766 0.740 0.643 0.533 0.511
Camp conditions	0.8541	Toilets at campsites Camp washing up space/facilities Water supply at campsites Camp cooking space/facilities Rain shelters at campsites	0.942 0.915 0.914 0.902 0.895
No extra items			

**IMPACT PERCEPTION SCALES** (from Question 5)

SCALE NAME (and description)	RELIABILITY (Kronbachs Alpha)	COMPONENT LIST VARIABLES (from original questionnaire lists)	LOADINGS (from PCA)
Seeing litter	0.7674	Litter on track Litter around hut Litter around campsites	0.728 0.664 0.583
Physical damage services	0.7009	Seeing trampling around wet areas Seeing where wood cut for fires Seeing human waste/toilet paper Seeing shortcuts off tracks	0.677 0.672 0.635 0.589
Hut/track congestion	0.7025	Too many people in hut Insufficient bunk space in huts Seeing too many big groups of people Having to rush for bunk in huts Noisy people in huts at night Seeing too many on the track each day	0.729 0.652 0.636 0.590 0.534 0.484
Over- development	0.8051	Too much development of signs Too much development of huts Too much development of tracks Too much development of campsites	0.805 0.799 0.798 0.582
Camp congestion	0.7031	Seeing people on guided trips of track Noisy people at campsites Having to rush for campsite space Too many others at campsites	0.756 0.711 0.701 0.600
Water/toilet/ hygiene	0.5503	Inadequate water supply Inadequate toilet facilities Seeing where campsites have formed Uncertainty in water hygiene	0.739 0.706 0.503 0.324
Extra items		Aircraft noise	

**MANAGEMENT PREFERENCE SCALES** (from Question 8)

SCALE NAME (and description)	RELIABILITY (Kronbachs Alpha)	COMPONENT LIST VARIABLES (from original questionnaire lists)	LOADINGS (from PCA)
Rationing/manipulate use	0.8357	Bookings for spaces at campsites Bookings for bunks in huts Require permits, and limit these Make track one-way only Make peak use times more expensive Remove some facilities to discourage use Encourage small groups/discourage large	0.862 0.845 0.778 0.571 0.524 0.454 0.353
Information management	0.7598	Provide info on physical impacts Provide info on social impacts Provide info on crowding conditions Provide info on different track options	0.828 0.779 0.743 0.628
More hut capacity	0.4977	Provide more bunks in huts Build more huts	0.754 0.732
Alternative options	0.4549	Provide more campsite/camping facilities Increase freedom for camping by tracks Make other track options cheaper Allow more guided trips/facilities Provide more alternative tracks	0.628 0.588 0.522 0.405 0.387

# Appendix 3

## Details of Travers–Sabine crowding scores

Crowding was assessed using a widely used nine-point crowding scale (Question 2), and Table A3.1 presents the responses from Travers–Sabine Circuit visitors.

TABLE A3.1. TRAVERS-SABINE CIRCUIT TRACK CROWDING SCORES.

DEGREE OF CROWDING	(scores)	TOTAL % (n = 237)
NOT CROWDED	(1)	33
	(2)	24
CROWDED — slightly	(3)	17
	(4)	6
	(5)	6
CROWDED — moderately	(6)	8
	(7)	3
CROWDED — extremely	(8)	2
	(9)	1

Shelby *et al.* (1989)<sup>1</sup> summarised and evaluated the accumulated results from this method, and developed an interpretation method to highlight the management significance of these responses. These interpretations, which can be considered carrying capacity judgements related to the quality of visitor experiences, apply to the ‘crowded’ respondents (e.g., those scoring 3 or more). Table A3.1 shows that the proportion of ‘crowded’ visitors on the Rakiura Track was 43%.

Table A3.2 presents a range of results from the other Great Walks and from studies summarised by Shelby *et al.* (1989). Accompanying these results are the interpretations applied to different crowding scores. The interpretation of 43% crowding on the Travers–Sabine Circuit is that use is at ‘low normal conditions’, where no problem situation associated with use-levels currently exists. These crowding levels suggest unique low-density recreation experiences are being maintained, but that these are likely to diminish if use-levels increase. These interpretations represent informed, but subjective, guidelines based upon extensive accumulated knowledge.

Comparing the Great Walk crowding scores in Table A3.2 and Figure A3.1 (following pages) indicates that crowding is relatively very low on the Travers–Sabine Circuit and, therefore, preventative management of serious effects arising from increasing use will be required first on other tracks.

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<sup>1</sup> Shelby, B.; Vaske, J.J.; Heberlein, T.A. 1989. Comparative analysis of crowding in multiple locations: Results of 15 years of research. *Leisure Sciences* 11: 269–291.

TABLE A3.2 DIFFERENT LEVELS OF 'CROWDED' RESPONSES. (AFTER SHELBY ET AL. 1989)

CROWD (%)	POPULATION	RESOURCE	STATE OR COUNTRY	RESOURCE CONDITIONS	CARRYING CAPACITY JUDGEMENT	
100	Boaters	Deschutes River	Oregon	Weekends section 1	<b>Much more than capacity</b> (80 - 100%) Manage for high density recreation experiences, or treat as a 'sacrifice area', allowing quantity of activity to compromise quality of experiences. Could be a localised compromise to reduce pressure on other areas.	
94	Anglers	Colorado River	Arizona	Thanksgiving weekend		
91	Boaters	Raystown Lake	Pennsylvania	On the lake		
89	Pheasant hunters	Bong Hunting Area	Wisconsin	Opening day		
88	Boaters	Deschutes River	Oregon	Weekdays section 1		
87	Riparian landowners	Lake Delavan	Wisconsin	Overall rating		
86	Goose hunters	Grand River Marsh	Wisconsin	Firing line		
85	Pheasant hunters	Public Hunting Area	Wisconsin	Opening day		
<b>* 76 *</b>	<b>Walkers (GW)</b>	<b>Routeburn Track</b>	<b>New Zealand</b>	<b>Summer</b>		<b>More than capacity</b> (65 - 80%) Studies and management are necessary to preserve recreation experiences, especially if low visitor impacts (social/physical) are important components. Immediate management to control use-levels at around 65% level of crowding conditions may be considered as an option. Research may be needed to establish more long-term solutions.
76	Trout anglers	Gun Powder River	Maryland	Opening day		
75	Salmon anglers	Waimakariri River	New Zealand	At river mouth		
75	Boaters	Raystown Lake	Pennsylvania	At attraction sites		
74	Salmon anglers	Rakaia River	New Zealand	At river mouth		
73	Canoers and boaters	Boundary Waters C.A.	Minnesota	Moose Lake		
72	Rafters	Grand Canyon	Arizona	1985 Summer		
70	Anglers	Klamath River	California			
70	Climbers	Mt. McKinley	Alaska			
<b>* 69 *</b>	<b>Walkers (GW)</b>	<b>Abel Tasman Track</b>	<b>New Zealand</b>	<b>Summer</b>		
69	Boaters	Door Country	Wisconsin			
<b>* 68 *</b>	<b>Walkers (GW)</b>	<b>Tongariro Crossing</b>	<b>New Zealand</b>	<b>Summer (Easter 86%)</b>		
68	Rafters	Rogue River	Oregon			
68	Rock climbers	Seneca Rocks	West Virginia			
66	Boaters	Raystown Lake	Pennsylvania	At put-in location		
<b>* 63 *</b>	<b>Walkers (GW)</b>	<b>Kepler Track</b>	<b>New Zealand</b>	<b>Summer (Easter 86%)</b>	<b>High normal conditions</b> (50 - 65%) Should be studied if increased use is expected, allowing management to anticipate problems. Represents the best time to establish more long-term management, as once higher crowding perceptions exist, there is difficulty in managing use 'down' to levels more	
63	Boaters	Raystown Lake	Pennsylvania	At take-out location		
<b>* 62 *</b>	<b>Walkers (GW)</b>	<b>Milford Track</b>	<b>New Zealand</b>	<b>Summer</b>		
62	Deer hunters	Sandhill	Wisconsin	1988 High-density hunt		
61	Goose hunters	Fishing Bay	Maryland	Firing line		
61	Floaters	Wolf River	Wisconsin			
59	Salmon anglers	Rakaia River	New Zealand	All anglers		
<b>* 58 *</b>	<b>Sea Kayakers (GW)</b>	<b>Abel Tasman Coast</b>	<b>New Zealand</b>	<b>Summer</b>		

	<b>Heaphy Track</b> Sandhill Lake Delavan Brule River Grand Canyon Snake River Mt. Jefferson Brule River	<b>New Zealand</b> Wisconsin Wisconsin Wisconsin Arizona Oregon Oregon Wisconsin	<b>Summer (Easter 71%)</b> One-day visit 1975 1985 Winter In Hell's Canyon High-use period	appropriate for the main recreation experiences desired.
<p>* 55 * <b>Walkers (GW)</b> Wildlife photographers Recreationists Anglers Rafters Rafters Backpackers Canoers</p>	<p><b>Heaphy Track</b> Sandhill Eagle Cap Wilderness Bong Hunting Area State-wide Rakaia River State-wide Brule River <b>Travers-Sabine Track</b> <b>Whanganui River</b> <b>Waikaremoana Track</b> Apostle Islands Stockings Park White Mt. Nat. Forest Klamath River Brule River</p>	<p><b>New Zealand</b> Wisconsin Oregon Wisconsin Wisconsin New Zealand Maryland Wisconsin <b>New Zealand</b> <b>New Zealand</b> <b>New Zealand</b> Wisconsin Michigan New Hampshire California Wisconsin</p>	<p><b>Low Normal Conditions</b> (35 - 50%) A problem situation does not exist at this time. As with the above category, these may offer unique low-density recreation experiences. These are likely to change with any increase in social or physical impacts resulting from increasing numbers of users, or from changes in activity types.</p>	<p><b>Low Normal Conditions</b> (35 - 50%) A problem situation does not exist at this time. As with the above category, these may offer unique low-density recreation experiences. These are likely to change with any increase in social or physical impacts resulting from increasing numbers of users, or from changes in activity types.</p>
<p>* 35 * <b>Walkers (GW)</b> Anglers Hikers Goose hunters Rafters Trout anglers Backpackers Deer hunters Trout anglers Canoists Goose hunters Deer hunters</p>	<p><b>Rakiura Track</b> Colorado River Dolly Sods Wilderness Tuckahoe State Park Illinois River Savage River Great Gulf Wilderness Sandhill Gunpowder River Wanganui River Grand River Sandhill</p>	<p><b>New Zealand</b> Arizona West Virginia Maryland Oregon Maryland New Hampshire Wisconsin Maryland New Zealand Wisconsin Wisconsin</p>	<p><b>Summer</b> Midweek Low-use period Low-density hunt Low use period Low use period 1982 Low-density hunt Late season Summer (Easter 68%) Managed hunt 1988 Low-density hunt</p>	<p><b>Suppressed Crowding</b> (0 - 35%) Crowding here is limited by certain management or situational factors, which allow particular low-density recreational experiences. These are likely to be unique, and managers should be concerned with maintaining them. Changes likely to increase visitor numbers/impacts should be considered carefully.</p>

\*\* and bold type identify the crowding responses for the tracks included in New Zealand's Great Walks.

FIGURE A3.1. DIFFERENT LEVELS OF 'CROWDED' RESPONSES ON GREAT WALKS.