

8. Visitor numbers on this trip may increase, and we want your opinion on the possible management actions we could take to deal with this. Please read each statement and circle the number best describing your opinion.

TO CATER FOR INCREASING NUMBERS, MANAGERS SHOULD: (n =403)	Strongly Agree	Tend to Agree	Neutral	Tend to Disagree	Strongly Disagree
INCREASE ACCOMMODATION CAPACITY					
- put more bunks in huts to accommodate more people	5	22	16	36	21
- build more huts to accommodate more people	7	19	13	28	33
- allow more guided trips, using separate huts/campsites	4	13	23	22	37
- build more campsites and provide facilities to encourage more camping	12	26	25	19	18
- encourage camping by allowing more freedom for camping beside the track	5	12	14	27	42
SPREAD USE OUT					
- provide more alternative tracks to spread people out	20	38	12	20	9
- make the busy times more expensive to encourage off-peak use	5	14	16	31	33
- make the track one-way, so fewer people are seen during the day	6	12	22	33	27
- make alternative areas much cheaper to attract use away from here	7	23	39	20	10
- encourage smaller group sizes, and discourage larger groups	24	31	28	10	6
LIMIT USER NUMBERS					
- have bookings for bunks in huts, as a way to limit numbers	15	29	13	24	18
- have bookings for campsites, as a way to limit numbers	11	23	23	24	19
- require permits to do the trip, and limit the number issued	13	25	17	22	22
- remove some facilities from huts and campsites to discourage use	4	7	16	32	41
PROVIDE MORE PRE-WALK INFORMATION					
- provide information about alternative trips to areas that people may enjoy more	26	47	23	3	2
- provide information about use-levels here, to encourage trips to other places	43	35	19	2	1
- provide information about impacts of use on nature (promote low-impact use)	42	36	19	1	1
- provide information about social impacts on experiences (promote good behaviour)	69	23	4	4	0
OTHER					

ATTACHED RESPONSES FROM QUESTIONNAIRE

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

A. Question 1. Nationality breakdown

NATIONALITY	NO'S	%
New Zealand	112	25
Germany	91	20
Great Britain	77	17
United States	50	11
Australia	16	3
Switzerland	16	3
Netherlands	23	5
Canada	18	4
Denmark	8	2
Israel	17	4
Japan	11	2
Other Europe*	14	3
Other Asia	0	0
Other	1	0

* 6 Belgium, 5 Sweden, 1 Austria, 1 Italy, 1 Norway

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

(i) Trip Duration on the Kepler Track

No. of nights on Kepler

	1 nights	2 nights	3 nights	4 nights	5+ nights
% trips this duration	8	52	39	1	0

(ii) Nights at Huts and/or Campsites

Overnight accommodation

	Huts only	Hut & 1 camp	Multiple huts/camps	Camps & 1 hut	Camps only
% trips	94	2	0	1	3

C. Question 3. Locations of Crowding Focus

Overall, (60%) of visitors (n=274) 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 — 263 specified huts as a focus of crowding (96% of 274). Of these, the specific focus responses highlighted the following main sites:

78% — Luxmore Hut 26% — Iris Burn Hut 11% — All huts

Campsites — 6 specified campsites as a focus of crowding (2% of 274).

On the track — 27 specified areas along the track as a focus of crowding (10% of 274). Of these, the specific focus responses highlighted the following main sites (at low frequencies):

44% — Luxmore Hut area 37% — at day shelters

Other — 4 specified 'other' areas as a focus of crowding (2% of 229). Of these, no particular areas were prominent.

Appendix 2

Details of Kepler Principal Components Analysis

Principal Component Analysis (PCA) was carried out upon selected subsets of response-list items from 454 respondents to the Kepler Track sample from the Great Walks survey. 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	RELIABILITY (Kronbachs Alpha)	COMPONENT LIST VARIABLES (from original questionnaire Q. 7 lists)	LOADINGS (from PCA)
Hut conditions	0.8223	Hut washing up space/facilities	0.759
		Hut cooking space/facilities	0.732
		Space to relax in huts	0.612
		Hut heating facilities	0.589
		Hut lighting facilities	0.578
		Hut drying space/facilities	0.561
		Water supply at huts	0.551
		Number of bunks in huts	0.544
Track standards	0.8514	Toilets at huts	0.504
		Bridges over rivers	0.759
		Boardwalks over wet/fragile areas	0.748
		Steps	0.732
		Smooth/easy surfaces	0.673
		Track marking	0.673
		Drainage of water	0.670
		Gentle slopes/not steep	0.617
Information services	0.8393	Distance/time signs	0.503
		Material from visitor centres	0.825
		Quality of maps/brochures	0.779
		Advice from visitor centres	0.729
		Maps/brochures in the huts	0.647
		Advice from wardens	0.593
Campsite condition	0.9667	Information signs by the track	0.544
		Toilets at campsites	0.942
		Camp washing up space/facilities	0.915
		Water supply at campsites	0.914
		Camp cooking space/facilities	0.902
Rain shelters at campsites	0.895		

IMPACT PERCEPTION SCALES (from Question 5)

SCALE NAME	RELIABILITY (Kronbachs Alpha)	COMPONENT LIST VARIABLES (from original questionnaire lists)	LOADINGS (from PCA)
Physical damage	0.8155	Litter on track	0.710
		Seeing human waste/toilet paper	0.698
		Litter around hut	0.693
		Seeing where wood cut for fires	0.616
		Seeing shortcuts off tracks	0.616
		Seeing trampling around wet areas	0.607
		Litter around campsites	0.545
		Seeing where campsites have formed	0.499
Hut/track congestion	0.7887	Too many people in hut	0.779
		Insufficient bunk space in huts	0.774
		Having to rush for bunk in huts	0.709
		Seeing too many big groups of people	0.615
		Noisey people in huts at night	0.572
		Seeing too many on the track each day	0.540
		Seeing people on guided trips of track	0.382
Over-develop-ment	0.7981	Too much development of tracks	0.860
		Too much development of huts	0.781
		Too much development of signs	0.748
		Too much development of campsites	0.487
Campsite congestion	0.7227	Noisey people at campsites	0.789
		Having to rush for campsite space	0.724
		Too many others at campsites	0.720
Water/toilet/hygiene	0.5559	Inadequate water supply	0.723
		Inadequate toilet facilities	0.624
		Uncertainty in water hygiene	0.621
Extra items		Noise from aircraft	

Perceptions of noise impacts from planes did not fit into any of the scales.

MANAGEMENT PREFERENCE SCALES (from Question 8)

SCALE NAME	RELIABILITY (Kronbachs Alpha)	COMPONENT LIST VARIABLES (from original questionnaire lists)	LOADINGS (from PCA)
Rationing/ use-limits	0.8311	Bookings for spaces at campsites Bookings for bunks in huts Require permits, and limit these	0.866 0.874 0.751
Information management	0.7626	Provide info on physical impacts Provide info on social impacts Provide info on crowding conditions Provide info on different track options	0.797 0.769 0.755 0.678
Increase accomodation	0.6289	Build more huts Allow more guided trips/facilities Provide more campsite/camping facilities Provide more bunks in huts Increase freedom for camping by tracks	0.801 0.639 0.633 0.506 0.475
Manipulate use conditions	0.5212	Make other track options cheaper Remove some facilities to discourage use Encourage small groups/discourage large Provide more alternative tracks Make peak use times more expensive	0.698 0.547 0.515 0.513 0.397
Extra items		Make the track one-way only	

The option of making the track one-way did not fit into any of the scales.

Appendix 3

Details of Kepler Crowding Scores

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

TABLE A3.1. KEPLER TRACK CROWDING SCORES.

DEGREE OF CROWDING	(scores)	TOTAL % (n=454)	SUMMER (n=403)	EASTER (n=51)
NOT CROWDED	(1)	20	22	4
	(2)	14	15	10
	(3)	17	16	20
CROWDED — slightly	(4)	8	8	4
	(5)	9	8	19
CROWDED — moderately	(6)	16	15	19
	(7)	8	7	16
CROWDED — extremely	(8)	6	6	8
	(9)	2	3	0

Shelby *et al.*(1989)¹ summarised and evaluated the accumulated results from applications of this approach, 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 Kepler Track was 63% in summer, and 86% at Easter.

Table A3.2 (next page) 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 63% crowding on the Kepler Track in Summer is that use is at “high normal conditions”, while 86% crowding at Easter is “much more than capacity”. Accepting that Easter currently represents an extreme situation, the interpretation of this Summer crowding is that research and other investigations are needed to allow management actions to prevent future congestion problems. This time is considered the best opportunity to take such actions before conditions have developed into a more serious state, and at 63%, summer crowding scores are close to exceeding the 65% level above which they

¹ 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.

could be interpreted as being “more than capacity”. These interpretations represent informed but subjective guidelines based upon extensive accumulated knowledge.

A comparison of the Great Walk crowding scores in Table A3.2 (see next two pages) and Figure A3.1 (see page 54) indicates that crowding is relatively high on the Kepler Track, and preventative management to minimise effects from increasing use will be required there before most other tracks.

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	Much more than capacity (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		
* 76 *	Walkers (GW)	Routeburn Track	New Zealand	Summer		More than capacity (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			
* 69 *	Walkers (GW)	Abel Tasman Track	New Zealand	Summer		
69	Boaters	Door Country	Wisconsin			
* 68 *	Walkers (GW)	Tongariro Crossing	New Zealand	Summer (Easter 86%)		
68	Rafters	Rogue River	Oregon			
68	Rock climbers	Seneca Rocks	West Virginia			
66	Boaters	Raystown Lake	Pennsylvania	At put-in location		
* 63 *	Walkers (GW)	Kepler Track	New Zealand	Summer (Easter 86%)	High normal conditions (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		
* 62 *	Walkers (GW)	Milford Track	New Zealand	Summer		
62	Deer hunters	Sandhill	Wisconsin	1988 High-density hunt		
61	Goose hunters	Fishing Bay	Maryland	Firing line		
61	Floater	Wolf River	Wisconsin			
59	Salmon anglers	Rakaia River	New Zealand	All anglers		
* 58 *	Sea Kayakers (GW)	Abel Tasman Coast	New Zealand	Summer		

	Walkers (GW)	Heaphy Track	New Zealand	Summer (Easter 71%)	appropriate for the main recreation experiences desired.
* 55 *	Walkers (GW)	Heaphy Track	New Zealand	Summer (Easter 71%)	appropriate for the main recreation experiences desired.
55	Wildlife photographers	Sandhill	Wisconsin	One-day visit	
54	Recreationists	Lake Delavan	Wisconsin	1975	
53	Anglers	Brule River	Wisconsin	1985 Winter	
53	Rafters	Grand Canyon	Arizona	In Hell's Canyon	
53	Rafters	Snake River	Oregon	High-use period	
53	Backpackers	Mt. Jefferson	Oregon		
52	Canoers	Brule River	Wisconsin		
50	Deer hunters	Sandhill	Wisconsin	1982 High-density hunt	Low Normal Conditions (35 - 50%) A problem situation does not exist at this time.
49	Backpackers	Eagle Cap Wilderness	Oregon	Late season	As with the above category, these may offer
48	Pheasant hunters	Bong Hunting Area	Wisconsin	No specific resource	unique low-density recreation experiences.
46	Deer hunters	Statewide	Wisconsin	Upstream	These are likely to change with any increase
45	Salmon anglers	Rakaia River	New Zealand	No specific resource	in social or physical impacts resulting from
44	Turkey hunters	Statewide	Maryland		increasing numbers of users, or from changes
43	Tubers	Brule River	Wisconsin	Summer	in activity types.
* 43 *	Walkers (GW)	Travers-Sabine Track	New Zealand	Summer	
* 42 *	Canoeists (GW)	Wanganui River	New Zealand	Summer	
* 42 *	Walkers (GW)	Waikaremoana Track	New Zealand	Summer	
42	Sailboaters	Apostle Islands	Wisconsin	Summer 1985	
41	Tourists and drivers	Stockings Park	Michigan	Presidential Range	
39	Backpackers	White Mt. Nat. Forest	New Hampshire		
38	Floaters	Klamath River	California	1985 Low-use period	
37	Canoers	Brule River	Wisconsin		
* 35 *	Walkers (GW)	Rakiura Track	New Zealand	Summer	Suppressed Crowding (0 - 35%) Crowding here is limited by certain
32	Anglers	Colorado River	Arizona	Midweek	management or situational factors, which
31	Hikers	Dolly Sods Wilderness	West Virginia	Low-use period	allow particular low-density recreational
27	Goose hunters	Tuckahoe State Park	Maryland	Low-density hunt	experiences. These are likely to be unique,
26	Rafters	Illinois River	Oregon		and managers should be concerned with
25	Trout anglers	Savage River	Maryland	Low use period	maintaining them. Changes likely to increase
24	Backpackers	Great Gulf Wilderness	New Hampshire	Low use period	visitor numbers/impacts should be considered
24	Deer hunters	Sandhill	Wisconsin	1982 Low-density hunt	carefully.
23	Trout anglers	Gundpowder River	Maryland	Late season	
20	Canoeists	Wanganui River	New Zealand	Summer (Easter 68%)	
17	Goose hunters	Grand River	Wisconsin	Managed hunt	
12	Deer hunters	Sandhill	Wisconsin	1988 Low-density hunt	

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

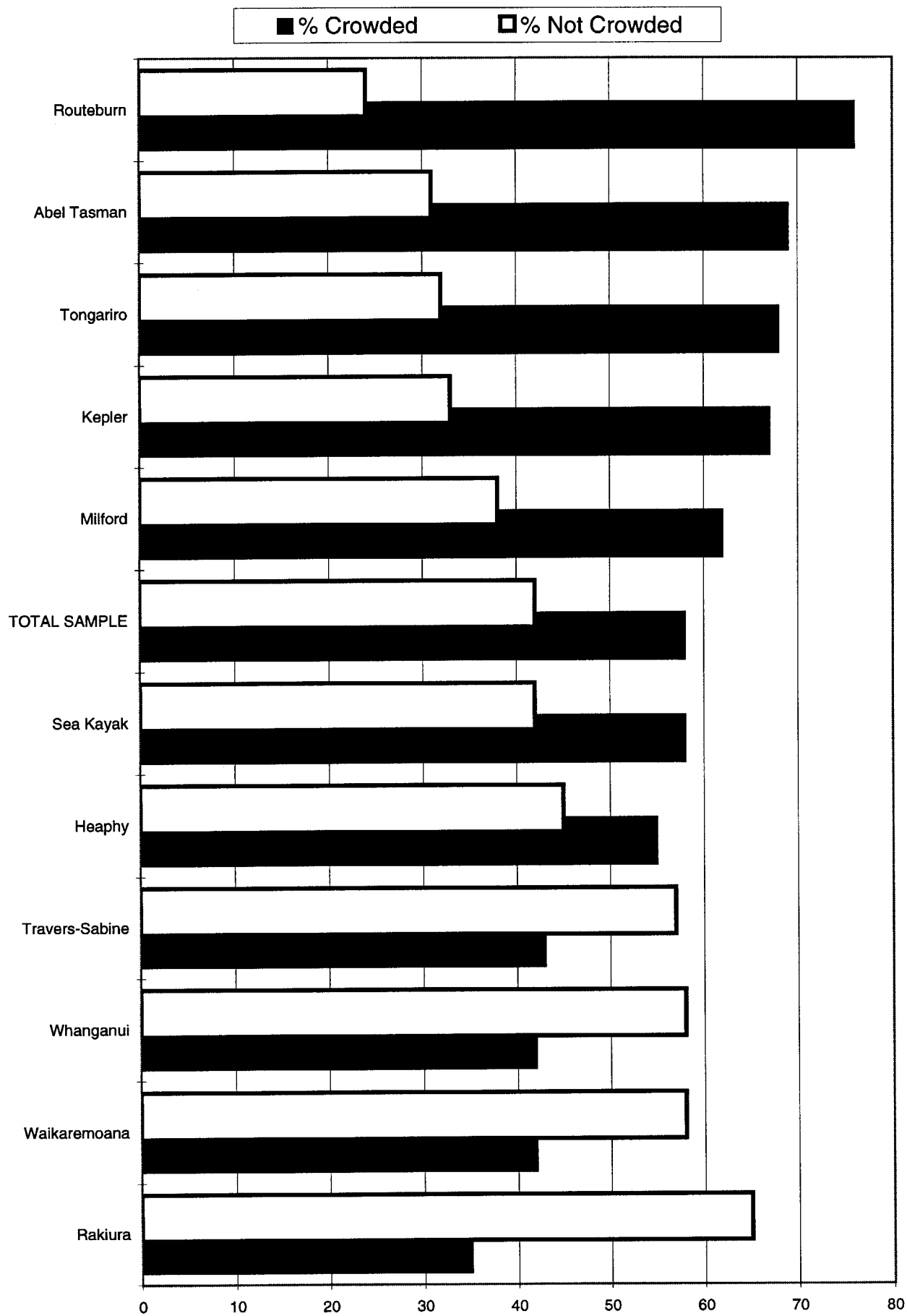


FIGURE A3.1. DIFFERENT LEVELS OF 'CROWDED' RESPONSES ON GREAT WALKS.