

## APPENDIX 5

### Summary tables (impact/crowding)

#### A5.1 Impact perception tables

Table A5.1 presents the overall results, summarised in Section 6.1 (Figure 5). The first column gives the % of those who did not perceive the impact; the second shows those who did perceive the impact, but who were not bothered by it; and the remaining three shows those who perceived it as a negative impact. The differences in impact perceptions between summer and Easter canoeists are presented in Table A5.2. Some of the main points and numerical values are marked in bold in the following tables.

#### A5.2 Encounter level tables

Average daily estimates of the reported and preferred encounter levels on the river (preferred levels in parenthesis) were: Summer - 2.4 (3.7), and Easter - 6.1 (4.8), see also Figure 9.

**Table A5.1 Overall impact perception scores.**  
(Read as row %; refer Figure 3)

Impact perception	Didn't notice	Not bothered	Bothered a little	Bothered a lot		Impact type
	(scores)	1	2	3	4	
<b>Litter in river</b>	57	2	<b>17</b>	<b>8</b>	<b>16</b>	Physical (Section 6.2)
<b>Litter at campsites</b>	54	6	<b>15</b>	<b>9</b>	<b>17</b>	
<b>Polluted water</b>	<b>18</b>	9	<b>26</b>	<b>15</b>	<b>31</b>	
Human waste/toilet paper	78	6	5	2	8	
Health problems	82	6	3	2	7	
Vegetation damage	64	18	10	4	4	
Over-development	37	<b>55</b>	6	1	1	Facility (Section 6.3)
Lack of adequate toilets/water	36	<b>41</b>	10	6	7	
Lack of firewood	65	21	11	1	1	
Sharing campsites	47	<b>41</b>	8	2	2	Capacity (Section 6.4)
Campsites full (could not use)	81	9	4	3	3	
Huts full (could not use)	85	12	1	1	1	
Too many other users	36	<b>44</b>	14	4	3	Conflict (Section 6.4)
Too many big groups	49	<b>34</b>	14	1	2	
Noisy campsite groups	79	10	4	2	4	
<b>Meeting jet boats</b>	<b>11</b>	<b>57</b>	<b>15</b>	<b>7</b>	<b>10</b>	
Meeting outboard boats	55	33	4	3	5	
Seeing goats	7	<b>71</b>	7	4	11	Animal control (Section 6.5)
Seeing dead animals	48	23	12	5	12	

Table A5.2 Impact perceptions in different seasons. (Refer Figure 4)

Potential impacts	Summer trip (n = 267)			Easter trip (n = 64)			Comments Chi square significance < .05 (*), .01 (**), of differences between summer and Easter score distributions.
	Did not notice this	NOT bothered by this	WAS bothered by this	Did not notice this	NOT bothered by this	WAS bothered by this	
Litter in River	56	1	43	65	2	33	Noticed more in summer, also more negative impact
Litter at campsites	53	7	40	57	25	18	* impact noticed and more negative in summer (more tolerance in Easter)
Polluted water	19	10	71	17	5	78	Little difference, high negative impact overall (perceived problem, not reality)
Human waste/toilet paper	76	6	18	85	5	10	Little difference, not noticed much overall
Health problems (water)	79	6	15	91	1	8	Noticed more in summer, but difference not great
Vegetation damage	62	19	19	74	14	12	Noticed more in summer, but difference not great
Over-development	39	54	7	31	62	17	Little difference, noticed by many, but high tolerance overall
Lack of adequate toilets/water	36	41	23	32	41	27	Little difference, noticed by many, high tolerance, some negative impact overall
Lack of firewood	64	22	14	70	15	15	Little difference, not noticed by many overall
Sharing campsites	55	37	8	11	60	29	** noticed much more in Easter, much tolerance, but also some negative impact
Campsites full (could not use)	85	10	5	64	8	28	** noticed more in Easter, also more negative impact
Huts full (could not use)	89	9	2	72	23	5	** noticed more in Easter, but high tolerance
Too many other users	41	44	15	10	44	46	** noticed much more in Easter, much tolerance, but also much negative impact
Too many big groups	56	32	12	15	48	37	** noticed much more in Easter, much tolerance, but also much negative impact
Noisey campsite groups	84	8	8	57	20	23	** more noticed in Easter, some tolerance, but more negative impact
Meeting jetboats	12	60	28	3	41	56	** noticed by many, high summer tolerance, high negative impact in Easter
Meeting outboard boats	59	31	10	37	39	24	** noticed more in Easter, high tolerance overall, more negative impact in Easter
Seeing goats	5	71	25	12	73	15	Little difference, a little more negative impact in summer
Seeing dead animals	54	20	26	22	38	40	Noticed more in Easter, high tolerance, but higher negative impact in Easter

**Table A5.3 On-river encounter preference: actual v. preferred.** (Refer Figure 10)

<b>Encounter preference (on-river)</b>	<b>Summer (n = 234)</b>	<b>Easter (n = 61)</b>
Actual encounters exceeded the levels preferred	13	51
Actual encounters equalled the levels preferred	26	21
Actual encounters within the levels preferred	61	28

**Table A5.4 Preferred frequency of overnight site sharing.** (Refer Figure 11)

<b>Encounter Levels (overnight sites)</b>	<b>Total</b>	<b>Summer</b>	<b>Easter</b>
Average number of nights spent on trip	3.5	3.7	2.8
Average number of nights sites were shared	1.2	1.0	2.1
Average number of nights sharing would be preferred	1.0	0.9	1.8

**Table A5.5 Overnight site-sharing preferences: actual v preferred.** (Refer Figure 12)

<b>Encounter preference (site-sharing)</b>	<b>Summer (n = 205)</b>	<b>Easter (n = 62)</b>
Sharing sites exceeded the levels preferred	27	55
Sharing sites equalled the levels preferred	56	34
Sharing sites within the levels preferred	17	11

### A5.3 Crowded canoeist tables

**Table A5.6 Impact perception differences (crowded/uncrowded).** (Refer Figure 13)

<b>Impact perceptions by crowding</b>		<b>Not Noticed</b>	<b>Not Bothered</b>	<b>Bothered by it</b>
Chi square significance < .05 (*), .01 (**)				
Seeing jetboats **	Crowded	5	40	55
	Uncrowded	13	62	25
Too many others **	Crowded	9	40	51
	Uncrowded	47	46	7
Too many big groups **	Crowded	17	45	38
	Uncrowded	61	30	9
Had to share camps **	Crowded	29	47	24
	Uncrowded	54	39	7
Seeing outboard boats **	Crowded	37	39	24
	Uncrowded	63	30	7
Campsites were full **	Crowded	70	13	17
	Uncrowded	86	8	6
Noisey at camps **	Crowded	67	17	16
	Uncrowded	85	7	8
Huts were full **	Crowded	75	21	4
	Uncrowded	89	8	3

**Table A5.7 Encounters levels on the river (crowded canoeists).** (Refer Figure 14)

<b>Encounters levels (on-river)</b> (average daily estimates)	<b>All uncrowded canoeists</b>	<b>All crowded canoeists</b>	<b>Crowded in summer</b>	<b>Crowded in Easter</b>
Reported encounter levels	2.1	<b>4.4</b>	3.0	<b>7.2</b>
Preferred encounter levels	<b>3.7</b>	3.9	2.8	6.2

**Table A5.8** Achievement of encounter preferences (crowded canoeists). (Refer Figure 15)

<b>Encounter preference (on-river)</b>	<b>Uncrowded</b> (n = 207)	<b>Crowded</b> (n = 90)
Actual encounter exceeded the levels preferred	12	<b>43</b>
Actual encounters equalled the levels preferred	23	30
Actual encounters within the levels preferred	<b>65</b>	27

**Table A5.9** Number of nights sites were shared (crowded canoeists). (Refer Figure 16)

<b>Encounter levels (overnight sites)</b>	<b>Uncrowded</b>	<b>Crowded</b>	<b>Crowded Summer</b>	<b>Crowded Easter</b>
Average number of nights spent on trip	3.6	3.3	3.5	2.9
Average number of nights sites were shared	1.0	1.5	1.4	<b>2.2</b>
Average number of nights sharing would be preferred	1.0	1.0	0.7	1.3

**Table A5.10** Achievement of sharing preferences (crowded canoeists). (Refer Figure 17)

<b>Encounter preferences (site-sharing)</b>	<b>Uncrowded (n = 175)</b>	<b>Crowded (n = 4)</b>
Sharing of sites exceeded the levels preferred	26	<b>48</b>
Sharing of sites equalled the levels preferred	54	44
Sharing of sites was within the levels preferred	<b>20</b>	8

## APPENDIX 6

### Crowding tables and other results

#### A6.1 Rating and interpretation

Crowding score rating and interpretive tables based upon Shelby *et al.* (1989) are presented in Table A6.1. The table of crowding scores from different settings (see Table A6.4) represents 15 years of research results using this approach (including Whanganui results).

Table A6.1 Crowding score rating.

Crowding Scale	Not at all crowded		Slightly crowded			Moderately crowded		Extremely crowded	
Scores	1	2	3	4	5	6	7	8	9
<b>% feeling crowded</b>	<b>Capacity judgement</b>		<b>Interpretation of score %</b>						
0–35	Suppressed crowding		Crowding limited by management of situational factors, may offer unique low density experiences.						
35–50	Low/normal		Problem situation does not exist at this time; as with the above category, may offer unique low-density experiences.						
50–65	High/normal		Should be studied if increased use is expected, allowing management to anticipate problems.						
65–80	More than capacity		Studies and management necessary to preserve experiences.						
80–100	Much more than capacity		Manage for high-density or sacrifice area.						

When the crowding scores are combined into a dataset, the capacity judgement can be made from the table based on the proportion feeling crowded. The crowding scores of the canoeists, including those apparent following dataset breakdown by season and entry-point, are listed in Table A6.2.

Table A6.2 Whanganui River crowding scores.

Degree of crowding	Scores	Total %	Summer	Easter
Not crowded	(1)	49	58	10
	(2)	22	22	21
Crowded – slightly	(3)	12	10	23
	(4)	5	4	10
	(5)	3	2	10
Crowded – moderately	(6)	6	4	20
	(7)	1	0	3
Crowded – extremely	(8)	1	1	0
	(9)	1	0	3

## A6.2 Variation in crowding focus (refer Section 7.2)

To identify any particular sites of crowding, those who had indicated some crowding focus were asked to name such sites. In Table A6.3, part (a) refers to the open-ended question asked, which received 94 diverse responses. These were aggregated for clarity, as it soon became apparent that no individual sites were particularly highlighted. Part (b) required indication of the general type of site where crowding occurred by using tick boxes, and received 100 responses.

**Table A6.3 Locations of most crowding.**

(a) Specific locations of crowding	Total (94)	Summer (59)	Easter (35)
In a specific hut	36	42	26
At a specific campsite	21	12	37
On the river itself	19	25	17
At specific landing/entry point	17	15	20
On specific walks/attractions	7	5	7
(b) General crowding site types	(100)	(65)	(35)
Mostly in the huts	24	32	9
Mostly at the campsites	30	20	49
At both huts and campsites	9	6	14
On the river	14	20	3
At landings	22	20	26
Other	1	2	0

Low overall response frequencies limited any detailed site-specific table here, with only Tieke hut being prominently cited (19% overall). The general finding was that no single site or situation-type was the focus of crowding perceptions. In part (b), where canoeists were required to select from a list, results can be considered more reliable. Here, the huts, campsites and landings were each indicated as the main location of crowding by over 20% of canoeists. Other inferences can be made from the trip season and entry breakdowns, but are necessarily tentative given the low response frequencies. Summer canoeists did not indicate any focal crowding location type. Easter and top-entry canoeists emphasised campsites, while mid-entry canoeists emphasised huts. Overall, it appears that a single site or site-type was not the focus of crowding perceptions. This suggests that a more general perception of crowding would be a more likely source. It certainly seems to require more investigation of crowding expectations and 'social-impact' aspects of crowding.

**Table A6.4 Crowding scores from different settings (based upon from Shelby *et al.* 1989).**

Crowd %	Population	Resource	State/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' by allowing the quantity of activity to compromise the quality of experiences. This compromise could be a localised effect to reduce pressure on other areas.
97	Boaters	Deschutes River	Oregon	Weekends section 4	
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	
88	Boaters	Deschutes River	Oregon	Weekdays section 4	
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	

Crowd %	Population	Resource	State/country	Resource conditions	Carrying capacity judgement
76	Trout anglers	Gun Powder River	Maryland	Opening day	<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.
75	Salmon anglers	Waimakariri River	New Zealand		
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	Boaters	Door Country	Wisconsin		
* 68 *	Canoists	Whanganui River ***	New Zealand	Easter Holiday	
68	Rafters	Rogue River	Oregon		
68	Rock climbers	Seneca Rocks	West Virginia		
66	Boaters	Raystown Lake	Pennsylvania	At put-in location	
63	Boaters	Raystown Lake	Pennsylvania	At take-out location	<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 appropriate for the main recreation experiences desired.
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	
57	Deer hunters-muzzle	Statewide	Maryland	No specific resource	
55	Deer hunters-bow	Statewide	Maryland	No specific resource	
55	Wildlife photog.	Sandhill	Wisconsin		
54	Recreationists	Lake Delavan	Wisconsin	One-day visit	
53	Deer hunters-gun	Statewide	Maryland	No specific resource	
53	Anglers	Brule River	Wisconsin	1975	
53	Rafters	Grand Canyon	Arizona	1985 Winter	
53	Rafters	Snake River	Oregon	In Hell's Canyon	
53	Backpackers	Mt. Jefferson	Oregon		
52	Canoers	Brule River	Wisconsin	1975 High use	
50	Deer hunters	Sandhill	Wisconsin	1982 High-density hunt	<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.
49	Backpackers	Eagle Cap Wilderness	Oregon		
48	Pheasant hunters	Bong Hunting Area	Wisconsin	Late season	
46	Deer hunters	Statewide	Wisconsin	No specific resource	
45	Salmon anglers	Rakaia River	New Zealand	Upstream	
44	Turkey hunters	Statewide	Maryland	No specific resource	
43	Tubers	Brule River	Wisconsin	1975	
42	Sailboaters	Apostle Islands	Wisconsin	1985	
41	Tourists and drivers	Stockings Park	Michigan		
39	Backpackers	White Mt. National	New Hampshire	Presidential Range	
38	Floaters	Forest	California		
37	Canoers	Klamath & Brule Rivers	Wisconsin	1985 Low use	
32	Anglers	Colorado River	Arizona	Midweek	<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.
31	Hikers	Dolly Sods Wilderness	West Virginia	Low-use period	
27	Goose hunters	Tuckahoe State Park	Maryland	Low-density hunt	
26	Rafters	Illinois River	Oregon		
25	Trout anglers	Savage River	Maryland	Low use period	
24	Backpackers	Great Gulf Wilderness	New Hampshire	Low use period	
24	Deer hunters	Sandhill	Wisconsin	1982 Low-density hunt	
23	Trout anglers	Gundpowder River	Maryland	Late season	
* 20 *	Canoists	Whanganui River ***	New Zealand	Summer season	
17	Goose hunters	Grand River	Wisconsin	Managed hunt	
12	Deer hunters	Sandhill	Wisconsin	1988 Low-density hunt	

## APPENDIX 7 Encounter level results

### A7.1 On-river encounters

Canoeists reported their frequencies of encounters with other groups on the river and at overnight sites, and what levels of these encounters they would prefer to have. Average daily on-river encounters with other groups were estimated by the canoeists, and these results are presented in Table A7.1.

Encounter levels were much less on summer and top-entry trips. This is shown by the % figures, and the overall daily averages calculated from the raw data frequencies. Easter encounters are over twice those of summer, while mid-entry trip encounters exceed those of top-entry trips. This pattern reflects the user counts (Table A1. 1), and the crowding perception scores. Once asked how many encounters they actually had, canoeists were then asked to indicate what levels of encounters they would prefer to have. This would help indicate whether actual encounter levels exceeded those preferred. The main limitation to this interpretation was that the preferred levels could not be obtained as expectations prior to the trip. However, there were some interesting results from this question, as presented in Table A7.2.

Overall, the highest tolerance for encounters was found amongst Easter canoeists (4.8 per day), followed by the mid-entry canoeists (4.4). Only amongst Easter canoeists were the average preferred encounter

**Table A71 Reported Encounters on the river.**

<b>Reported encounters (average daily estimates)</b>	<b>Total %</b>	<b>Summer</b>	<b>Easter</b>	<b>Top-entry</b>	<b>Mid- entry</b>
No groups seen	1	2	0	2	0
1 group seen	24	28	10	30	11
2 groups seen	32	37	15	32	33
3 groups seen	18	19	17	17	23
4 groups seen	7	7	10	4	15
5 groups seen	5	3	12	5	2
6–10 groups seen	9	4	27	6	16
More than 10 groups seen	2	0	10	3	0
<b>Overall daily average</b>	<b>3.1</b>	<b>2.4</b>	<b>6.1</b>	<b>2.9</b>	<b>3.5</b>
(n =)	302	242	59	206	92

**Table A7.2 Preferred encounters on the river.**

<b>Preferred encounters (average daily estimates)</b>	<b>Total %</b>	<b>Summer</b>	<b>Easter</b>	<b>Top-entry</b>	<b>Mid-entry</b>
No others	4	5	1	3	6
1 group	13	12	17	15	9
2 groups	23	26	9	26	17
3 groups	20	21	15	22	13
4 groups	10	9	13	9	13
5 groups	12	11	20	12	13
6–10 groups	15	14	18	10	25
More than 10	2	1	7	2	3
<b>Average daily preference</b>	<b>3.8</b>	<b>3.7</b>	<b>4.8</b>	<b>3.5</b>	<b>4.4</b>
(n =)	295	242	54	200	95



levels exceeded by the actual (6.1 per day). This may provide some explanation for the higher crowding scores given by Easter canoeists. Further evidence for this was found when actual encounters and preferences were cross-tabulated. This enabled distinction to be made between those who saw more than they would have liked, and those who saw less. Results derived from these cross-tabulations are summarised in Table A7.3.

**Table A7.3 Achievement of encounter preferences.**

<b>Encounter preference achievement (on-river)</b>	<b>Total % (n = 295)</b>	<b>Summer (n = 234)</b>	<b>Easter (n = 61)</b>
Saw over maximum encounter levels preferred	31	13	51
Saw the same as maximum encounter levels preferred	24	26	21
Saw below maximum encounter levels preferred	45	61	28

Here, more Easter canoeists encountered others on the river at higher levels than they would prefer (51% v 13% in summer). In summer, 61% of canoeists had encounter levels below that which they would be happy with (v 28% at Easter). Again, higher crowding perceptions are indicated for Easter canoeists.

Overall, there is need for caution by managers in their use of visitor perceptions to assess social impacts from increasing use levels. There is some indication here that as use-levels and the associated encounters with other canoeists increased (Table A7.1), so too did canoeist tolerance levels for these increased encounters (as expressed by preferred encounter levels - Table A7.2). In Easter, when actual encounter levels and crowding perceptions were greatest, also came the highest stated levels of acceptable encounters. It appears here that encounter tolerance has varied according to the prevailing conditions of use, with tolerance levels increasing to accommodate increasing use-levels and actual encounter levels. However the presence of 'tolerance thresholds', beyond which acceptable levels are exceeded by actual levels, is suggested by the Easter situation. For most other canoeists, acceptable encounter levels increased with higher actual levels, but mostly exceeded them. For Easter, when encounter levels were at their highest, acceptable encounter levels were also higher. But here, the actual levels more often exceeded those considered acceptable. In these circumstances, the higher crowding perceptions of Easter canoeists would seem logical. However, for better resolution of these questions, further research is required.

## **A7.2 Encounters with jetboats**

Given the well documented conflicts between motorised and non-motorised recreation groups, canoeists were also asked the number of jetboat encounters they would tolerate. These results are presented in Table A7.4.

**Table A7.4 Preferred jetboat encounter levels.**

<b>Preferred jetboat encounters (average daily estimates)</b>	<b>Total %</b>	<b>Summer</b>	<b>Easter</b>	<b>Top-entry</b>	<b>Mid-entry</b>
None	17	16	21	6	1
1 preferred (max.)	21	22	14	26	18
2 preferred (max.)	28	29	27	36	25
3 preferred (max.)	11	11	11	11	15
4 preferred (max.)	8	8	7	6	15
5 preferred (max.)	5	5	7	5	10
Over 5 preferred	9	9	12	9	14
Average daily preference	2.5	2.5	2.5	2.3	3.3
(n =)	290	234	56	174	78

Most canoeists felt that between two or three jetboat encounters per day would be acceptable. Mid-entry canoeists were those most tolerant of jetboat encounters. This may have reflected a greater frequency of jetboats on the bottom section.

Easter canoeists, despite their higher crowding perceptions and negative jetboat perceptions, did not prefer jetboat encounter levels any lower than did other canoeists. This provides further support for the suggestion that the canoeists exhibit an 'elastic tolerance' for encounters with other users, which is partially defined by the conditions they experience on-site. These results indicated that encounter preference levels increased as actual encounters increased, although for Easter, actual levels exceeded those preferred.

### A7.3 Encounters at overnight sites

Other questions were asked about encounters at sites canoeists stayed overnight on trips. The first question dealt simply with the number of nights spent on each trip, as shown in Table A7.5.

**Table A7.5 Number of nights on trip.**

<b>Number of nights on trip</b>	<b>Total %</b>	<b>Summer</b>	<b>Easter</b>	<b>Top-entry</b>	<b>Mid-entry</b>
1 night	3	3	0	2	5
2 nights	15	12	27	3	41
3 nights	37	31	60	34	42
4 nights	29	33	13	36	13
5 nights	10	13	0	15	0
Over 5 nights	6	7	0	9	0
<b>Average nights/trip</b>	<b>3.5</b>	<b>3.7</b>	<b>2.8</b>	<b>3.9</b>	<b>2.6</b>
<b>(n =)</b>	<b>324</b>	<b>262</b>	<b>63</b>	<b>223</b>	<b>104</b>

Clear trip duration differences were apparent between the different trip types. They match those identified from the map data (Table A4.2). Important here is comparison of these results with those of the numbers of nights that overnight stays (huts/camps) were shared (Table A7.6).

Interesting points emerged when the two tables are compared. Overall for all the canoeists, an average trip lasted 3.5 nights. Up to 35% of these canoeists did not share an overnight site, and when sharing

**Table A7.6 Number of nights sites were shared.**

<b>Nights sites were shared</b>	<b>Total %</b>	<b>Summer</b>	<b>Easter</b>	<b>Top-entry</b>	<b>Mid-entry</b>
None	35	43	3	30	45
1 night	31	32	24	33	24
2 nights	18	14	35	18	19
3 nights	11	6	34	12	11
4 nights	3	3	3	4	1
5 nights	1	1	0	1	0
Over 5 nights	1	1	0	1	0
<b>Average nights share</b>	<b>1.2</b>	<b>1.0</b>	<b>2.1</b>	<b>1.3</b>	<b>0.9</b>
<b>(n =)</b>	<b>307</b>	<b>246</b>	<b>62</b>	<b>216</b>	<b>91</b>

did occur, it did so on an average of 1.2 nights per trip. So on an average trip, sharing took place on 34% of nights (dividing shared nights by trip nights).

Using this pattern of interpretation, average summer trips were longer (3.7 nights), up to 43% of canoeists did not share a site, and when sharing did occur, it was on only 27% of nights on average (1.0 nights). By contrast, average Easter trips were shorter (2.8 nights), only 3% of canoeists did not share a site, and when sharing did occur, it was on up to 75% of nights on average (2.1 nights). The potential for crowding and conflict perceptions appears much higher in the Easter period, and may provide for the explanation of the high Easter crowding scores and reported encounters. As indicated by Lythgoe (DoC, pers. comm.), Easter canoeists, on their very limited time budgets, were more likely to start trips at similar times and their use of overnight sites would overlap. Hence their site sharing frequency would be higher.

Canoeists on top-entry trips had more overnight stays on average (3.9 nights) and shared on 33% of these (1.3 nights). Overall, 30% did not have to share a site. The mid-entry trips had on average 2.6 overnight stays, and shared sites on 34% of these (0.9 nights). Overall, 45% did not have to share sites. Differences here were small, apart from the higher number of top-entry canoeists having to share sites.

The result above indicated the actual encounters with others at overnight sites. Canoeists were also asked how often they would prefer to have to share sites. These results are presented in Table A7.7.

**Table A7.7 Preferred frequency of overnight site sharing.**

<b>Preferred frequency of shared nights</b>	<b>Total %</b>	<b>Summer</b>	<b>Easter</b>	<b>Top-entry</b>	<b>Mid-entry</b>
<b>None</b>	57	68	38	57	57
<b>1 night</b>	12	13	11	12	12
<b>2 nights</b>	12	11	23	12	14
<b>3 nights</b>	11	8	24	10	14
<b>4 nights</b>	6	7	4	8	2
<b>5 nights</b>	1	1	0	1	0
<b>Over 5 nights</b>	0	0	0	0	0
<b>Average preferred</b>	1.0	0.9	1.8	1.0	0.9
<b>(n =)</b>	273	220	53	193	80

Overall, 57% of all canoeists preferred not to share overnight sites with others. This preference was considerably higher amongst summer canoeists than Easter canoeists (68 v 38%). This is an interesting contrast, as Easter canoeists appear more tolerant of sharing sites, despite consistently indicating higher crowding perceptions. Preference for sharing sites appeared linked to the actual nights shared, with tolerance levels apparently rising as actual use-level encounters rose. This would suggest some acceptance of the particular conditions experienced by canoeists as being the 'norm', around which preferences would be formed. However, there is other data which does demonstrate that a crowding effect is occurring here also. Table A7.8 presents a summary of results from cross-tabulations of the number of nights that sites were shared, by the number of nights the canoeists would prefer to share.

These results showed that during Easter in particular, canoeists actually shared overnight sites (huts and/or campsites) more often than they would have preferred (55%). Summer canoeists were more likely to feel the number of nights they actually shared was the ideal number. This again suggests that Easter conditions have induced greater crowding potential and perceptions. As with the on-river encounters discussed previously, there is need for caution when managers are interpreting and managing social impacts of use, based on visitor perceptions alone.

Table A7.8 Achievement of site sharing preferences.

Achievement of encounter preference (Sites shared)	Total % (n = 267)	Summer (n= 205)	Easter (n= 62)
on more nights than the maximum preferred	34	27	55
on the same number of nights as preferred	50	56	34
on fewer nights than the maximum preferred	16	17	11

#### A7.4 Crowded canoeists and encounter preferences

Differences arose between crowded and uncrowded canoeists in encounter perceptions and preferences. As shown in Table A7.9, the crowded canoeists reported over twice the encounter levels of uncrowded canoeists, and this distinction was even greater at Easter. This indicated further support for a link here between higher use-levels and crowding perceptions.

However, preference for fewer encounters did not appear to have an inverse relationship with increasing actual encounter levels. This is evident from comparing the average daily preferences of Tables A7.9 and A7.10. Here those with higher reported levels of actual encounters also had higher tolerance levels.

Table A7.9 Reported encounters on the river by crowded canoeists.

Reported encounters (Average daily estimates)	Total %	Uncrowded	Crowded	Crowded Summer	Crowded Easter
No groups seen	1	2	0	2	0
1 group seen	24	31	10	12	2
2 groups seen	32	35	15	39	10
3 groups seen	18	18	17	21	16
4 groups seen	7	6	10	10	10
5 groups seen	5	2	12	8	16
6–10 groups seen	9	4	27	10	29
More than 10 groups seen	2	0	10	0	15
Overall daily average	3.1	2.1	4.4	3.0	7.2
(n =)	302	213	89	51	38

Table A7.10 Preferred encounters on the river of crowded canoeists.

Preferred encounters (average daily estimates)	Total %	Uncrowded	Crowded	Crowded Summer	Crowded Easter
No others	4	5	1	6	3
1 group	13	12	17	14	11
2 groups	23	26	9	23	11
3 groups	20	21	15	31	16
4 groups	10	9	13	10	11
5 groups	12	11	20	10	22
6–10 groups	15	14	18	6	18
More than 10	2	1	7	0	8
Average daily preference	3.8	3.7	3.9	2.8	6.2
(n =)	295	206	89	51	38

This again suggests that as use increased, a change in the tolerance of increasing numbers was also occurring. Even amongst the crowded canoeists, actual levels of encounters were generally less than the levels they indicated they could tolerate. However, again the exception was Easter, where the actual average daily encounter levels were higher than those levels considered acceptable (7.2 v 6.2). This reinforced the position of Easter as a clear crowding situation, where the apparent tolerance-change appeared to have been reversed. Such relationships and thresholds have been investigated extensively in other research, and while no conclusive patterns have been established, it does appear that some elements of social carrying capacity are being exceeded under Easter conditions. This corresponded with the interpretation of Easter crowding scores made in Appendix 5.

There were also some differences in trip durations, and the reported and preferred levels of encounters at overnight sites. Overall, crowded canoeists were on shorter trips than those 'uncrowded' (3.3 v 3.6 nights on average). And in addition there were major differences in the number of nights that overnight sites were shared, as shown in Table A7.11.

**Table A7.11 Number of nights sites were shared (crowded canoeists).**

<b>Nights that huts/campsites were shared with others</b>	<b>Total %</b>	<b>Uncrowded</b>	<b>Crowded</b>	<b>Crowded Summer</b>	<b>Crowded Easter</b>
None/ did not share site	35	41	20	36	0
1 night	31	34	23	28	17
2 nights	18	14	30	18	44
3 nights	11	8	20	8	34
4 nights	3	2	5	6	5
5 nights	1	0	1	2	0
Over 5 nights	1	0	1	2	0
<b>Average no. nights shared (% of average trip nights)</b>	<b>1.2 (34%)</b>	<b>1.0 (28%)</b>	<b>1.5 (45%)</b>	<b>1.4 (40%)</b>	<b>2.2 (76%)</b>
<b>(n =)</b>	<b>307</b>	<b>216</b>	<b>91</b>	<b>50</b>	<b>41</b>

Overall, only 35% of canoeists did their trip without having to share a hut or campsite. Those who had to share did so on an average of 34% of trip nights (e.g., about 1 in 3). This varied considerably according to crowding perception and season.

Amongst crowded canoeists, only 20% did not have to share sites. The 80% who shared did so on an average of almost half the trip nights (45%). This was more acute for the crowded canoeists at Easter, all of whom had to share sites (100%), on an average of 76% of trip nights (e.g., everyone shared on almost all nights). Summer crowding appeared less acute, with 36% of crowded canoeists not having to share, and the 64% who did share did so on only 40% of nights. This suggested that overnight site congestion was of less importance relative to other factors in prompting crowding perceptions in summer.

Amongst uncrowded canoeists, 41% managed to avoid sharing a site. The 59% who shared did so on an average of about a quarter of trip nights (28%). These results indicated that uncrowded canoeists were on trips with the least occurrence of overnight sharing. Those most often crowded at Easter had the highest level of sharing overnight sites with others. However, site-sharing was not the sole source of crowding perceptions, as evident from the 36% of summer canoeists who felt crowded, but who had not shared any overnight sites. This indicated other impact factors were contributing to crowding perceptions, as discussed in Section 6.

## APPENDIX 8

### Estimated campsite/hut capacities.

This list, based upon manager estimates, represents the current and maximum potential site capacities on the Whanganui River. Current capacity represents the maximum capacity currently available. Potential capacity represents the maximum possible capacity, assuming the adequate provision of services and facilities (e.g., toilets, water).

**Table A8.1 Hut and campsite capacities.**

<b>Campsite/hut</b> (notes attached indicating site status in 1994)	<b>Current capacity</b>	<b>Potential capacity</b>
Ohinepa	100	120
Poukaria	40	60
Maharanui (Mangahutu)	70	120
Whakahoro hut	16	25
Whakahoro campsite	300	300
Mangapapa	30	50
Kirikiroa (maybe relocated due to wahi tapu concerns)	60	100
Ohauora	60	100
Kawaka (Otaihanga)	50	50
John Coull hut	36	36
Kotukutuku (Reperepe)	100	180
Puketapu (closed because of wai tapu concerns)	closed	closed
Mangawaiti	60	80
Upper Mangapurua	100	120
Lower Mangapurua (closed because of wai tapu concerns)	10	80
Tieke hut/marae	16	25
Tieke camp	100	200
Lower Tieke (will be developed further)	100	150
Upper Ngaporo (closed because of wai tapu concerns)	60	100
Lower Ngaporo (development being negotiated)	50	60
<b>Total visitor nights</b>	<b>1358</b>	<b>1956</b>

This list suggests there is a significantly higher capacity for visitors to the river, with up to 2000 visitor nights apparently possible given the provision of facilities. However, this is misleading for two reasons.

The first reason is the uneven distribution of this capacity along the river (Figure 2), and the resulting bottlenecks. This further limits the physical capacity of the river to accommodate visitors.

The second reason is that the social capacity of these sites would be exceeded long before physical limits were reached. Should use exceed social tolerances, as was becoming apparent in Easter, the quality of experiences would be compromised, and the nature of the recreation experiences changed.