

Whitewater Kayaking in Hawke's Bay: Application of the River Values Assessment System (RiVAS)



Kay Booth
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Land Environment & People



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FOREWARD BY EXPERT PANEL

This report is endorsed by the Expert Panel of kayakers (below) as a useful first step in identifying the value of Hawke's Bay rivers for whitewater kayaking.

However, the Panel acknowledges that:

- Additional work is needed to be confident that the assessment reflects the values of the wider kayaking community. The assessment is a best estimate only, given a lack of existing data and limitations to the Expert Panel's knowledge;
- Other rivers and river reaches not included in this assessment may also have whitewater kayaking value.

The assessment is primarily intended as an engagement tool to assist the Hawke's Bay Regional Council in planning for more sustainable management of the region's rivers. The Resource Management Act 1991 (RMA) makes it clear that its purpose includes enabling people and communities to provide for their social wellbeing, of which whitewater kayaking is a part (RMA Part 2, section 5).

The assessment is neither intended, nor robust enough, to be used definitively in the RMA resource consenting process.

For more information on the appropriate application of this assessment please contact Whitewater NZ (the national organisation representing recreational whitewater kayaking and canoeing in New Zealand) and Hawke's Bay Canoe Club (a member of Whitewater NZ).

Sean Bellamy

Warren Hales

Bernie Kelly

Mark Mahoney

1. INTRODUCTION

1.1 PURPOSE

This report presents the results from an application of the River Values Assessment System (RIVAS) for whitewater kayaking in the Hawke's Bay Region undertaken in April 2010. This is the second application of the RIVAS for whitewater kayaking in New Zealand; the first was conducted in the West Coast Region (Booth, et al., 2010). This application is based on the method outlined in Hughey et al. (2009). The Hawke's Bay Regional Council (HBRC) held a workshop on 16-17 April to apply this method to identified Hawke's Bay rivers.

The application of the method for whitewater kayaking would be enhanced by research to inform underlying assumptions and replace data estimates (see Step 10). In particular, elucidation of the factors used by kayakers to value rivers is required.

1.2 PREPARATORY STEP: ESTABLISH AN EXPERT PANEL AND IDENTIFY PEER REVIEWERS

The Expert Panel for whitewater kayaking in the Hawke's Bay region comprised Bernie Kelly, Sean Bellamy, Mark Mahoney and Warren Hales. Andy England, Kay Booth (facilitator), Graham Sevicke-Jones and Chris Reed acted as advisors. Credentials of members of the Expert Panel and the advisors are provided in Appendix 1.

2. APPLICATION OF THE METHOD

STEP 1: DEFINE RIVER VALUE CATEGORIES AND RIVER SEGMENTS

RIVER VALUE CATEGORIES

Whitewater kayaking is a multi-dimensional form of recreation. It is undertaken by people with different skill levels and encompasses a range of types of experiences (e.g. easy introductory paddling to technically challenging descents). It may be undertaken as a commercial activity (e.g. skill instruction or river guiding) and competitively. Whitewater kayaking is usually undertaken in groups for safety reasons, giving the activity a strong social dimension. It is resource-dependent – it requires whitewater and is strongly influenced by the type and quality of whitewater. Whitewater kayaking is also a continually evolving activity, and has changed dramatically since the 1970s with the advent of plastic craft and the resulting ability to paddle increasingly difficult rivers. Kayak design continues to advance and a variety of boat options are available to suit different types of water and paddling styles.

Whitewater kayaking is undertaken using a double-bladed paddle with the kayaker in a sitting position and enclosed in a water-tight cockpit. Other whitewater pursuits such as canoeing (use of a single-bladed paddle in a kneeling position) rafting, river bugging and river boarding¹ were excluded from this assessment, because some different characteristics apply to them. As the Panel had some experience of whitewater rafting in Hawke's Bay, important reaches were noted in Appendix 4.

RIVER SEGMENTS

In advance of the workshop, one member of the Expert Panel worked with Regional Council staff to identify river reaches that were kayaked. This draft list was discussed and amended as required by the Panel at the beginning of the assessment workshop. The final list represents sections of rivers that are regularly kayaked, or hold value for whitewater kayakers even if seldom kayaked.

¹ A river bug is a small one person inflatable craft specially designed for running rapids, propelled from a seated position by kicking with finned feet and paddling with webbed gloves. The participant moves downriver feet first. In river boarding (also known as whitewater sledging), the participant travels head-first downstream, using a river board that they partially lie on, and steers using fins on their feet.

Flatwater reaches (Grade I – see Table 1) were excluded from the assessment. However a separate “Bottom List” of flatwater reaches used by whitewater kayakers (in whitewater kayaks) was made in order to alert the Regional Council to these places. This included areas popular for whitewater kayak training (e.g. schools), slalom training, etc. (see Appendix 4).

This identification of rivers and reaches was based on Panel members’ local knowledge, with additional reference to a national whitewater kayaking guidebook (Charles 2006). Using this approach, the selected rivers and reaches represent the most valuable whitewater kayaking resources in the region.

14 rivers were subdivided into sections (representing different kayak runs), giving a total of 30 river reaches. In addition, 2 rivers (Mohaka and Ngaruroro) were assessed as whole rivers, as well as their component reaches, to reflect the value of their cumulative, multi-day opportunities. The list of Hawke’s Bay whitewater kayaking river sections is presented in Appendix 4.

Hawke’s Bay rivers not included in the assessment were considered to hold:

1. Negligible value for whitewater kayaking: either they had no whitewater kayaking value (e.g. flat water) or they had been kayaked, but were considered to hold low value (i.e. unlikely to become popular owing to factors such as unusual flow regimes or variable terrain); or
2. Unknown kayaking value (yet to be paddled); or
3. Known kayaking value, but not accessible at the time of the assessment.

The assessment of kayaking river reaches in this study pertains to present-day kayaking opportunities. The Panel stressed that river value may change over time, subject for example to access provision. This “snapshot in time” will need to be updated to reflect changing opportunities and additional data.

As part of the assessment, the grade of a river or reach was assessed. A river’s grade does not imply value (all grades may be equally valued) but provided a useful check for the Panel to ensure they were considering all types of kayaking opportunity (novice, intermediate, expert). See Table 1.

Table 1: International scale of whitewater difficulty (Charles 2006:14-15)

Grade I	Moving water with a few riffles and small waves. Few or no obstructions.
Grade II	Easy rapids with waves up to one metre. Clear channels obvious without scouting. The ability to move your craft across the current is not necessary.
Grade III	Rapids with high, irregular waves and narrow passages. The ability to spin and manoeuvre is necessary.
Grade IV	Difficult rapids requiring a series of controlled moves, cross-current and spinning in confused water. Scouting often necessary and a reliable roll is mandatory.
Grade V	Very difficult, long and violent rapids. Nearly always must be scouted. Definite risks in the event of a mishap. Requires a series of controlled, precise, ‘must make’ moves to navigate successfully.
Grade VI	Extreme, very dangerous and only for experts. Close inspection is mandatory and all possible safety precautions should be taken.

OUTCOMES

- Whitewater kayaking defined to exclude canoeing, rafting, river bugging and similar pursuits, but includes all types of whitewater kayaking on rivers of Grade II and above.
- Confirmed list of Hawke’s Bay rivers and river reaches valued for whitewater kayaking for assessment.
- Additional “Bottom List” of flatwater reaches used by whitewater kayakers for reference only.

STEP 2: IDENTIFY ATTRIBUTES

Attributes used to describe whitewater kayaking in the West Coast pilot assessment (Booth et al., 2009) were discussed by the Panel and “taken as given” for the Hawke’s Bay assessment. However, the appropriate mix of attributes, that represents kayaker values and the regional context, was considered further during and after the assessment. Key comments are included in Step 3.

OUTCOME

A list of all attributes is provided in Appendix 2. This list is similar to that presented for the West Coast Region, but includes additional Hawke’s Bay comments from carrying out the assessment.

STEP 3: SELECT AND DESCRIBE PRIMARY ATTRIBUTES

The primary attributes used for the West Coast pilot assessment were applied to Hawke’s Bay rivers. The Panel discussed the primary attributes at the beginning of the workshop to familiarise themselves and confirm that they felt the attributes applied to Hawke’s Bay. Additional discussion at the conclusion of the workshop confirmed they applied to the region. However, it was noted (several times) that the lack of data about kayaking and kayakers’ views meant the appropriateness of these primary attributes was unconfirmed.

Comments expressed about the primary attributes were:

- Having two attributes that pertain to *scenic* and *wilderness* values may skew the results toward paddlers who value these attributes and have the skills to kayak more remote and difficult rivers (possibly an older demographic). It was suggested that younger paddlers often focus more upon the technical aspects of kayaking rather than the scenic and wilderness quality of the run. Rivers paddled by introductory kayakers are likely to score lower on wilderness value, since that type of paddler needs easy access for safety reasons.
- *Density of high quality hydraulic features* was considered in terms of how “busy” the kayaker was. Where rivers had sections of both busy (dense) and not dense whitewater, an averaging process was used. Concern was expressed that this decreased the value of some whitewater sections where the run included less-dense sections. The assessment also focused on the quality of the features as well as their density. Density was considered in the context of the type of kayaking opportunity offered (e.g. density suitable for Grade II paddlers and the features relevant to them, such as good eddy lines).

There was some concern, particularly after the assessment, that *density of high quality hydraulic features* was the only attribute representing in-water experience, despite its fundamental importance to most kayakers. The Panel discussed the potential benefit of adding another attribute related to what kayakers value about a run. “*Iconic features*” was one suggestion (i.e. the presence of whitewater features that make a fundamental contribution to the in-water experience). “*Desire to return*” was another suggested attribute that seeks to encapsulate the in-water “buzz” experienced. These additional attributes were dismissed by the Panel due to the current lack of supporting data, time constraints and general agreement that such additions were unlikely to radically affect assessment results.

- *Flow reliability (% time river kayakable)* was considered an important attribute to inform regional council river management, but it may fit less well as a measure of kayaker value. One Panelist commented that low flow rarely meant an aborted trip. In addition, the issue of inter-regional comparison was raised. Hawke’s Bay rivers may score lower on this attribute due to rainfall characteristics, thereby lowering overall regional scores.
- *Ease of access* was considered an important but problematic attribute. For this reason it was scored and commented on, but was not included at the later river ranking stage. The Panel noted that access is a “big issue” for Hawke’s Bay kayakers and restricts kayaking on certain rivers. Ease of access can change quickly if landowners change.
- It was agreed that *scarcity of kayaking opportunity* was an important attribute, but needed greater definition. Discussions confirmed that this was about identifying “the best” of a certain

type of opportunity at either a national or regional level. One Panel member suggested you could address this attribute by asking, "Which rivers would kayakers least want to lose".

OUTCOME

Appendix 2 describes the seven primary attributes considered in the Hawke's Bay assessment (in bold).

STEP 4: IDENTIFY INDICATORS

Indicators were adopted from the West Coast pilot assessment. The seven indicators (one for each primary attribute) were:

1. *Perception of scenic attractiveness (rating scale)*: the scale from the 1991 *River Use Survey* (NZCA 1991) was used, which incorporates elements of river scenery descriptors published by Egarr and Egarr (1981) and Egarr et al. (1979). This scale was not used in the West Coast pilot, but was recommended for future assessments.
 1. *Not attractive: river environs and surrounding country generally uninspiring, river water may be dirty or discoloured.*
 2. *Moderately attractive: some local features of scenic interest, mixed with less attractive sections.*
 3. *Attractive: scenic appeal is significant, but generally derived from local features such as bankside vegetation and the nature of the river environs rather than large scale grandeur.*
 4. *Very attractive: river environs scenic and sometimes spectacular. Surrounding country provides striking views.*
 5. *Inspiring: scenery spectacular and varied. Large scale vistas (e.g. mountains/bush/open country), and/or unique and striking river environs (e.g. rock formations, gorges, overhanging vegetation, deep and clear pools, rapids).*

It would be desirable to draw upon kayaker perceptions of scenic attractiveness from river level. However, in the absence of such data, the Expert Panel provided data estimates.

2. *Perception of wilderness character (rating scale)*: this measure was used in the 1991 *River Use Survey* (NZCA 1991). The Expert Panel provided estimates for individual rivers. The 1991 ranking scale was:
 1. *No wilderness feeling; road traffic or other human activity generally visible/audible from river. Highly modified river environment.*
 2. *Little wilderness feeling; roads/human activity readily accessible from river, even if not directly visible. River environment show obvious signs of modification.*
 3. *Some wilderness feeling; river environment may be modified, but canoeist is essentially isolated from immediate human activity. Roads generally reachable from river, but may involve some rough scrambling.*
 4. *Strong wilderness feeling; largely unmodified environment, with very limited access to any form of roading, Walking out from river feasible, but could take up to a day.*
 5. *Exceptional wilderness feeling; pristine environment, extreme sense of remoteness, walk-out long arduous, and difficult.*
3. *Density of high quality hydraulic features (rating scale)*: this indicator was defined as "the number, variety and quality of hydraulic features (e.g. waves, holes, eddies, drops)" (Whitewater NZ 2009). The Expert Panel estimated data for this indicator.
4. *Flow reliability (% of time river is kayakable)*: this attribute was assessed with respect to the percentage of time the river or reach is suitable for the particular kayaking opportunity for which it is valued (e.g. % time able to be paddled as an easy, learn-to-kayak opportunity). In the absence of any empirical data, the Expert Panel estimated data for this indicator.

This indicator presented challenges for the hydro-controlled Waikaretaheke River. The Panel decided to keep with the original rating scale, which gave such sections low scores, as they can only be paddled a few days each year. An alternative viewpoint is that these rivers offer

very reliable flows, in that kayakers (who know about the opportunity) could guarantee flows on specific days.

5. *Number of users (kayaker days per annum)*: a positive relationship was assumed between number of users and kayaking value, although high-skill (high grade) and remote rivers will only be used by small numbers of kayakers and this does not mean those rivers have low kayaking value. In the absence of empirical data, kayaker days were estimated within broad bands. Ideally, more robust user count data would be used.
6. *User catchment (home district/region)*: a positive relationship was assumed between distance travelled to paddle a river and kayaking value. Kayaker origin was considered the most appropriate metric. The scale used was:
 1. *Within district (primarily attracts local users e.g. live within territorial authority boundary in which river is located).*
 2. *Within region (regional council boundary) but outside home district.*
 3. *From neighbouring region (home region borders region in which river is located).*
 4. *Rest of New Zealand but beyond neighbouring regions.*
 5. *International.*

A threshold of 10% of users from a higher catchment level was chosen to trigger the higher rank (e.g. $\geq 10\%$ of users from other countries would receive a '5' score as 'international'; $\geq 10\%$ of users from districts within the region but not the same district as that in which the river is located would receive a '2' score as 'within region').

In the absence of empirical data, estimates of the Expert Panel were used.

Edge-of-region rivers (e.g. Hangaroa) raise a scoring issue as they are more likely to attract kayakers from neighbouring regions.

7. *Scarcity of the kayaking opportunity (rating scale)*: a positive relationship between scarcity and kayaking value was assumed (i.e. the more scarce the opportunity, the greater the value). The "kayaking opportunity" refers to the type of kayaking experience (e.g. multi-day wilderness opportunity). In the absence of data, Panel estimates were applied using the following scale:
 1. *Not scarce*
 2. *Regionally scarce*
 3. *Nationally scarce (irrespective of whether scarce regionally)*

Ease of access (mode) was recorded for information only (Appendix 4). The Hawke's Bay Panel agreed with the West Coast Panel that mode of access was problematic as an indicator and did not necessarily represent the kayaking value of the river.

The scale used was:

1. *Helicopter*
2. *Long walk-in*
3. *4WD vehicle*
4. *2WD vehicle*

Access is an obvious prerequisite for kayaking to take place and mode is a practical measure of ease of access. Although a positive relationship may exist between mode of access and kayaking value (i.e. easy access contributes to a higher value), the Panel noted two exceptions. Firstly, helicopter access, although difficult, *may* contribute positively to kayaker experience, especially as this mode is rare nationally and internationally. Secondly, even long walk-in access may contribute positively to the experience by adding an additional element to the physical activity, enhancing the kayaker's relationship with nature and increasing the challenge. Most helicopter and walk-in access is focused on Grade 4-5 kayak runs. However, there is no linear relationship between river grade and ease of access (some Grade 5 rivers offer 2WD vehicle access).

The Panel suggested that the difficulty and frustration encountered in securing permission to access are key factors affecting kayaker experience. Ease of access can change quickly with land ownership.

OUTCOME

- Hawke's Bay indicators are listed in Appendix 2 and assessed against SMARTA criteria in Appendix 3 (i.e. specific, measurable, achievable, relevant, timely, already in use).

STEP 5: DETERMINE INDICATOR THRESHOLDS

The scoring thresholds developed for the West Coast pilot assessment were applied within Hawke's Bay without any modification:

Attributes, indicator scores (IS) and associated threshold scores (TS) of relative importance (high, medium, low) are listed below:

1. *Perception of scenic attractiveness*

Perception of wilderness

Density of high quality hydraulic features

The 5-point scoring applied to these indicators was assigned thresholds scores (TS) as follows:

IS 4 or 5 = TS 3 (high)

IS 3 = TS 2 (medium)

IS 1 or 2 = TS 1 (low)

2. *User catchment (home district/region):* an exception to the above 5-point scale was applied:

IS 4 (rest of NZ) or IS 5 (international) = TS 3 (high)

IS 2 (within region) or IS 3 (from neighbouring region) = TS 2 (medium)

IS 1 (within "district" i.e. local) = TS 1 (low)

3. *Flow reliability (% of time river kayakable):* thresholds were applied in equal divisions (thirds):

IS > 66% time kayakable = TS 3 (high)

IS 33-66% time kayakable = TS 2 (medium)

IS < 33% time kayakable = TS 1 (low)

4. *Number of users (kayaker days per annum):* thresholds were limited to broad bands to avoid giving a false impression of Panel certainty:

IS >500 kayaker days p.a. = TS 3 (high)

IS 100-500 kayaker days p.a. = TS 2 (medium)

IS <100 kayaker days p.a. = TS 1 (low)

5. *Scarcity of kayaking opportunity:*

IS 3 (nationally scarce, irrespective of regional scarcity) = TS 3 (high)

IS 2 (regionally scarce) = TS 2 (medium)

IS 1 (not scarce) = TS 1 (low)

6. *Ease of access (i.e. mode) (Information only):*

IS 4 (2WD access) = TS 3 (high)

IS 3 (4WD access) = TS 2 (medium)

IS 1 (helicopter access) or IS 2 (walk in) = TS 1 (low)

OUTCOME

- Thresholds are identified in Appendix 2.

STEP 6: APPLY INDICATORS AND INDICATOR THRESHOLDS

All data were estimated by the Expert Panel.

OUTCOME

- Data estimates are shown in Appendix 4.

STEP 7: WEIGHT THE PRIMARY ATTRIBUTES

The Expert Panel reviewed the seven primary attributes and considered whether some made a relatively greater contribution to the understanding of whitewater kayaking. The outcome of this discussion was to leave the attributes equally weighted. The primary rationale was that data were not available to identify the relative contribution of each attribute to the value placed on rivers by kayakers.

OUTCOME

- Equal weighting applied to the seven primary attributes.

STEP 8: DETERMINE RIVER VALUE FOR WHITEWATER KAYAKING

STEP 8A: RANK RIVERS

The spreadsheet in Appendix 4 was used to sum the indicator threshold scores for each river or reach and then sort in descending order. This provided a list of rivers and reaches ranked by their value scores.

Review of this ranked list by the Panel identified that two river reaches stood out as under-valued (i.e. they were lower in the ranked list than the value ascribed to them by the Expert Panel). These were:

- **Waikaretaheke River: Piripaua – Terapatiki.** Hydro-controlled and therefore low scoring for *flow reliability (% of time kayakable)*
- **Mohaka River: Mountain Valley (SH5) – Glenfalls**

Discussion took place and indicators were reassessed, but no changes were made. Instead, ranking rules were applied to help address the Waikaretaheke River rankings, which were considered artificially low due to being hydro-controlled and scoring low on flow reliability (% time river kayakable) (see Step 8B). The Panel decided that a top “Medium” ranking was acceptable for the Mohaka (Mountain Valley – Glenfalls) reach.

The representiveness of subdividing long rivers that offer important multi-day kayak opportunities was discussed. Such subdivision failed to capture the cumulative value of the whole river (sum may be greater than parts). The Panel decided to include the Mohaka and Ngaruroro Rivers *in toto*, as well as providing assessments of individual sections. All possible multi-day combinations were considered, not just a whole river trip.

STEP 8B: IDENTIFY RIVER'S VALUE TO KAYAKING

Hawke's Bay rivers of “High”, “Medium” and “Low” overall value for whitewater kayaking were identified by applying rules to the ranked list of rivers (see Appendix 4). These rules were informed by careful inspection of the ranked list and subsequent discussion about those reaches that appeared lower ranked than expected (Step 8A).

The use of ranking rules in the Hawke's Bay assessment to assign “high”, “medium” and “low” river kayaking values was a departure from the West Coast method where the Panel relied on its own expertise to assign thresholds or cut-off points. Both methods were considered for Hawke's Bay, but a rules system seemed to better fit those rivers valued highly (or lowly) by the Expert Panel. Ranking rules also enabled more appropriate ranking of the two reaches noted in Step 8A.

Attribute ranking rules applied by the Panel were:

- **“HIGH” kayaking value river** = scored a 3 for *scarcity of kayaking opportunity* AND scored at least three 3s across all indicators (excluding Access)
- **“LOW” kayaking value river** = scored a 1 for *scarcity of kayaking opportunity* AND scored at least three 1s across all indicators (excluding Access)
- Remaining rivers were classified as **“MEDIUM” kayaking value**.

Using these rules, 8 reaches were assessed as high value, 16 as medium value and 6 as low value. In addition, the Mohaka and Ngaruroro were both assessed as high value as whole rivers (cumulative, multi-day value).

OUTCOMES

- A list of rivers ranked by the scoring system from highest to lowest, which represents an initial ranking for kayaking value (Appendix 4).
- Rivers identified as high, moderate and low value for whitewater kayaking (Appendix 4 and Figure 1 – Figures 2 and 3 provide more detail for northern and southern rivers respectively, including locations of flatwater sections).
- Rivers in the Hawke's Bay region not listed have either negligible whitewater kayaking value or hold value but are unable to be accessed by kayakers (as at April 2010).

STEP 9: OUTLINE OTHER FACTORS RELEVANT TO THE ASSESSMENT OF SIGNIFICANCE

During the workshop, the Expert Panel discussed additional attributes of relevance to significance assessment, at present unquantifiable. These included:

- Connectedness – contribution to the suite of kayaking opportunities in the region.
- User's perceptions of the river's importance (including its 'status').
- Potential future kayaking use.
- Existence and option value.

These attributes do not influence the numeric calculation of river significance, but are relevant to decision-making about whitewater kayaking.

OUTCOME

- List and description of non-measured attributes (Appendix 5).

STEP 10: REVIEW ASSESSMENT PROCESS AND IDENTIFY FUTURE INFORMATION REQUIREMENTS

The Expert Panel did not discuss future research needs. However, it was clear from the workshop that the Panel wish to replace data estimates with empirical data. This would increase confidence in the assessment outcome.

The Panel considered the assessment provides a useful first step to inform future management for kayaking, but should not replace discussions with Whitewater NZ (the national organisation representing recreational whitewater kayaking and canoeing in New Zealand), Hawke's Bay Canoe Club and any other relevant organisations.

Given the shortage of empirical data, care should be taken not to over-rely on the river rankings or take the assessment as a definitive statement of value (e.g. for consenting purposes). The Panel likened the ranking exercise to “ranking your kids” - all kayaking opportunities have value in different ways and the task is to better understand these to inform management.

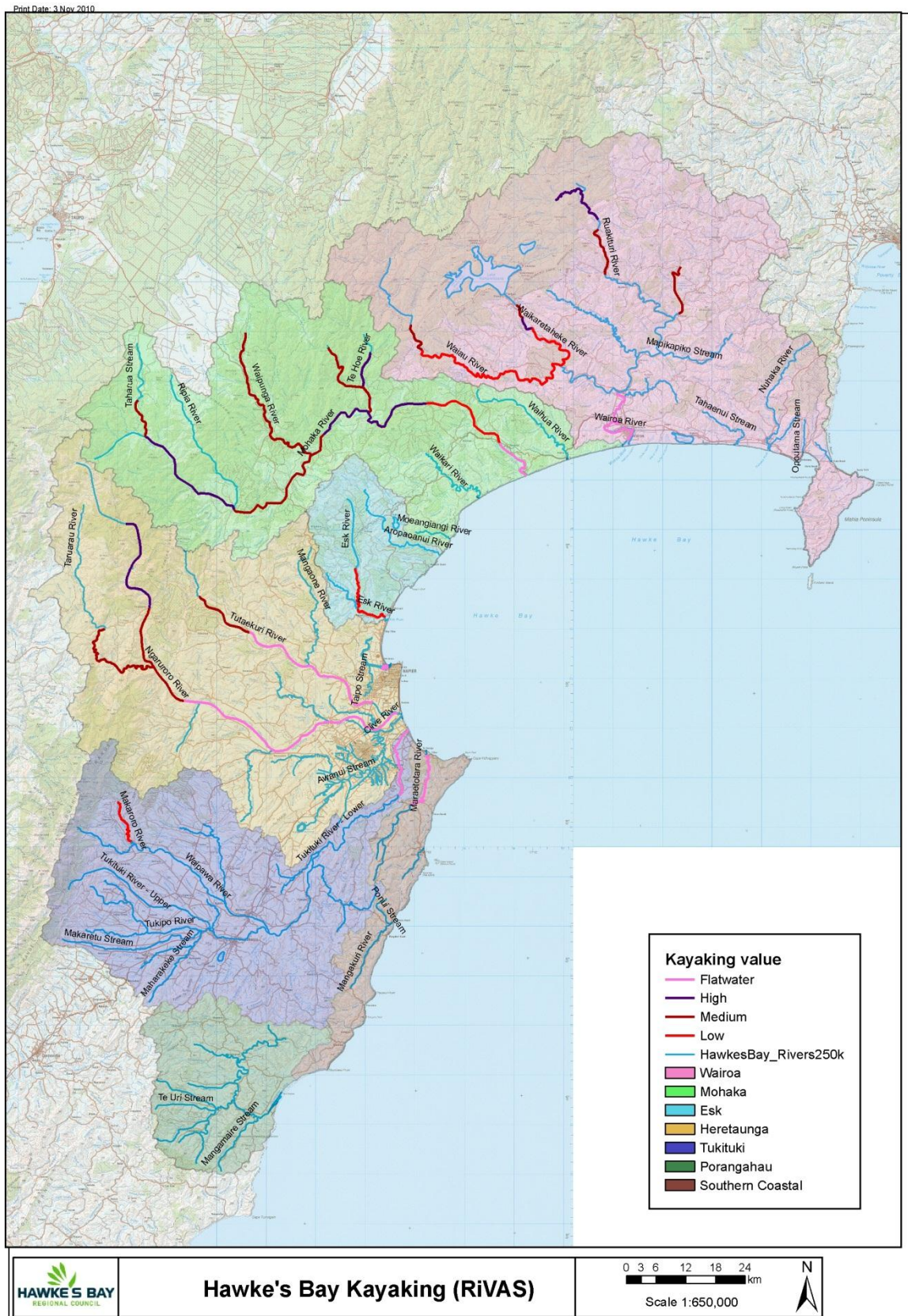


Figure 1: Hawkes Bay whitewater kayaking rivers mapped by significance level



Figure 2: Northern Hawkes Bay kayaking rivers – whitewater and flatwater sections and reference numbers (see Appendix 4)



Figure 3: Southern Hawke's Bay kayaking rivers – whitewater and flatwater sections and reference numbers (see Appendix 4)

ACKNOWLEDGEMENTS

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APPENDIX 1: CREDENTIALS OF THE EXPERT PANEL MEMBERS AND ADVISORS

Expert Panel:

1. **Sean Bellamy** has paddled in Hawke's Bay since 1987 and lived there for the past 5 years. Sean is member of both Whitewater NZ and Hawke's Bay Canoe Club. His paddling background includes slalom, river running and commercial whitewater raft guiding. Sean has lived and kayaked in most parts of New Zealand over the past 27 years, as well as a number of locations overseas. These days he is largely a recreational boater. Sean has an interest in resource management and water issues, along with Masters degrees in Earth Science and Regional and Resource Planning. He has worked as a planner and consents officer in local government in Hawke's Bay.
2. **Warren Hales** has been kayaking as part of Hawke's Bay Canoe Club since 1987, but using Hawke's Bay rivers since the late 1970's (rafting, camping, fishing, hunting). Warren is involved in conservation, first descent investigations, search and rescue and general training. He has paddled all over New Zealand and internationally.
3. **Bernie Kelly** is President of Hawke's Bay Canoe Club (HBCC), which is a member of Whitewater NZ. Bernie started kayaking in 1988 and participated in a HBCC beginners' course. He has continued to paddle extensively since then, throughout Hawke's Bay and other parts of the country. Bernie has served on the HBCC Committee for a number of years, culminating in his position as President.
4. **Mark Mahoney** is a recreational kayaker and rafter based in the Hawke's Bay, who enjoys a wide variety of wilderness adventures and sports. He has been kayaking and rafting for the last twenty years, mainly in the North Island. Mark has undertaken approximately half of the runs identified in this assessment, including multi day headwaters trips. Mark is a Chartered Professional Engineer in the fields of Environmental and Civil Engineering and works for his own consultancy firm based in Te Awanga. He is experienced in Resource Management and Environmental Urban Design fields.

Advisors:

1. **Dr Kay Booth** (facilitator) is an outdoor recreation researcher and planner. She is the Director of Lindis Consulting and, until recently, a Senior Lecturer in parks, recreation and tourism at Lincoln University. She is conversant with existing data about outdoor recreation. With colleagues, Kay developed the significance assessment method on which this application is based and facilitated the West Coast whitewater kayaking case study. She holds appointments on the New Zealand Walking Access Commission, the New Zealand Geographic Board and the New Zealand Conservation Authority. She is a novice whitewater kayaker.
2. **Andy England** is a member of Whitewater NZ based on the West Coast. He has been kayaking whitewater since he was a teenager growing up in the UK. Andy has competed in slalom kayaking and travelled the world to kayak and explore whitewater rivers in Norway, France, Austria, Italy, the USA, Canada, Nepal and New Zealand. He is qualified as a Level 1 kayak coach by the New Zealand Outdoor Instructors Association and has taught kayaking since 1988. In 1991 he moved to Scotland to be closer to more adventurous whitewater rivers and since 2001 has lived in Greymouth. Andy has kayaked rivers extensively on the West Coast. He is Deputy Principal of Greymouth High School.
3. **Chris Reed** is a Senior Planner in the Strategic Development Group for Hawke's Bay Regional Council. He has lived and worked in Hawke's Bay for 3 years. Previously Chris lived in the UK, working as a policy planner at district and county levels.
4. **Graham Sevicke-Jones** is Environmental Science Manager for Hawke's Bay Regional Council.

APPENDIX 2: ASSESSMENT CRITERIA FOR WHITEWATER KAYAKING (STEPS 2-4)

ATTRIBUTE CLUSTERS	ATTRIBUTE (primary attributes in bold)	DESCRIPTION OF PRIMARY ATTRIBUTES	INDICATORS	INDICATOR THRESHOLDS	DATA SOURCES (AND RELIABILITY)
Step 2: Identify attributes Step 3: <u>Select</u> and describe primary attributes		Step 3: Select and <u>describe</u> primary attributes	Step 4: Identify indicators	Step 5: Determine significance thresholds	
ATTRIBUTES ASSOCIATED WITH EXISTING USE					
Users	Number of users	High use implies high value. However, this assumption will under-value special and remote places for several reasons, including: Activity specialisation. Resources suitable for highly specialised participants (high skill levels) will attract low numbers of users but may be highly valued and/or rare opportunities. Access. Restrictions upon access will reduce use and/or make it available only to some potential users due to cost, availability of time, specialised equipment or transport, physical capability, etc. Wilderness and remote areas. Areas that offer few encounters with other people may be highly valued for this attribute (amongst other things).	Number of kayaker days per annum	High: >500 kayaker days per annum (score: 3) Medium: 100-500 kayaker days per annum (score: 2) Low: <100 kayaker days per annum (score: 1)	Expert Panel estimate (fair)
	Level of commercial use	This may imply higher value (positive relationship with level of commercial use).			

ATTRIBUTE CLUSTERS	ATTRIBUTE (primary attributes in bold)	DESCRIPTION OF PRIMARY ATTRIBUTES	INDICATORS	INDICATOR THRESHOLDS	DATA SOURCES (AND RELIABILITY)
	User catchment	<p>Origin of users is suggested as an indicator of quality of the recreational experience, based on the assumption that the higher the expected quality of the experience, the greater the distance users will be prepared to travel.</p> <p>A threshold of 10% of users from the district/region triggers the rank, e.g. 10% of users from other countries receive a '5'; 10% of users from districts within the region but not the same district as that in which the river is located receive a '2'.</p> <p>Edge-of-region rivers could be overrated using the selected indicator thresholds. Their user catchment is inevitably inter-regional.</p>	<p>Kayaker's home district/region:</p> <p>1=With district (local) (e.g. live within territorial authority boundary in which river is located).</p> <p>2=Within region (regional council boundary) but outside home district.</p> <p>3=From neighbouring region (home region borders region in which river is located).</p> <p>4=Rest of New Zealand but beyond neighbouring regions.</p> <p>5=International.</p>	<p>High: Rest of New Zealand, or International (score: 3)</p> <p>Medium: Within region, or From neighbouring region (score: 2)</p> <p>Low: Within district (score: 1)</p>	Expert Panel estimate (fair)
	Desire to return	The Panel considered this could be developed as a useful overall indicator of how kayakers value a run (i.e. how strong is the desire to paddle it again?). A user survey would be required.			
Activity	Skill required	Correlates positively with a river's whitewater grade (Step 1, Table 1).			
	Type of use	For example, beginner instruction; adventure kayaking.			

ATTRIBUTE CLUSTERS	ATTRIBUTE (primary attributes in bold)	DESCRIPTION OF PRIMARY ATTRIBUTES	INDICATORS	INDICATOR THRESHOLDS	DATA SOURCES (AND RELIABILITY)
Environmental setting: Water characteristics	Density of high quality hydraulic features	Number, variety and quality of hydraulic features (e.g. waves, holes, eddies, drops). Density of high quality hydraulic features should be considered in the context of the type of kayaking opportunity offered (e.g. the grade of paddlers attracted). Density is averaged over an entire reach.	Kayakers' perception. Interim metric is Expert Panel estimate (5-point rating scale): 1=Very few features to 5=Very many features	High: High density (score: 3) Medium: Medium density (score: 2) Low: Low density (score: 1)	Expert Panel estimate (good)
	Flow reliability	Generally correlates positively with kayaking value, but there are exceptions. Reliability will influence user catchment as locals will more able to take advantage of unpredictable flow events. Hydro-controlled rivers create assessment difficulties as they offer a low % of time kayakable, but very reliable timing.	% of time river is kayakable. Expert Panel estimate: bands of 10%	High: >66% (score: 3) Medium: 33-66% (score: 2) Low: <33% (score: 1)	Expert Panel estimate (fair)
	Whitewater character	Includes gradient and volume of river section (e.g. low volume, high gradient pool drop c.f. continuous low gradient but large volume river sections).			
	Continuity of whitewater features	How often features occur in a single run.			
	Length of kayak run	Usually, the longer the run, the higher the value.			
	Presence of "play spots"	"Playing" does not involve travel downstream. Play spots may be present only in certain flows.			

ATTRIBUTE CLUSTERS	ATTRIBUTE (primary attributes in bold)	DESCRIPTION OF PRIMARY ATTRIBUTES	INDICATORS	INDICATOR THRESHOLDS	DATA SOURCES (AND RELIABILITY)
	Presence of iconic river features	The Panel felt the primary focus could be the presence of in-water features that make a fundamental contribution to kayaker experience.			
	Water quality	Includes clarity, purity and ability to support ecosystems and species. High water quality is 'nice to have' and not essential but normally adds to a river's value.			
	Scenic attractiveness	A common attribute in (the few) river user surveys. Generally, it is expected that there is a positive relationship between perceived scenic attractiveness and kayaking amenity.	Kayaker's perception of scenic attractiveness. Expert Panel estimate (5-point rating scale): 1=Not attractive to 5=Inspiring	High: Very attractive (score: 3) Medium: Attractive (score: 2) Low: Not attractive (score: 1)	Expert Panel estimate (good)
	Wilderness character	This setting attribute has a positive relationship with kayaking amenity – the higher the perceived wilderness character, the higher the kayaking value.	Kayaker's perception of wilderness character. Expert Panel estimate (5-point rating scale): 1=No wilderness value to 5=Exceptional wilderness value	High: very high wilderness value (score: 3) Medium: moderate wilderness value (score: 2) Low: low wilderness value (score: 1)	Expert Panel estimate (good)
Social setting	Encounters with other river users	May influence (positively or negatively) the kayaking experience			

ATTRIBUTE CLUSTERS	ATTRIBUTE (primary attributes in bold)	DESCRIPTION OF PRIMARY ATTRIBUTES	INDICATORS	INDICATOR THRESHOLDS	DATA SOURCES (AND RELIABILITY)
	Behaviour of other river users	May influence (positively or negatively) the kayaking experience			
Managerial setting	Ease of access (initially selected as a primary attribute, but removed from river scoring as problematic)	Mode of access used as a surrogate for ease of access. Usually the easier the access, the higher the value, however helicopter access or interesting walk-in may be a positive aspect of the kayak experience and therefore reverse this relationship.	Transport mode: 1=helicopter 2=long walk-in 3=4WD vehicle 4=2WD vehicle	High: 2WD (score: 3) Medium: 4WD (score: 2) Low: helicopter, walk-in (score: 1)	Expert Panel estimate (very good)
Experiences	Perceptions of the importance of the river	Linked to river's status to kayakers. Any future survey of kayakers should ask this question, as has been done in the past. In a sense, it synthesises all other attributes			
Other outcomes	Economic benefits	Expenditure by kayakers in local area, region, nation			
	Non-economic benefits	For example, kayakers attracted to live in region owing to kayaking amenity			

ATTRIBUTE CLUSTERS	ATTRIBUTE (primary attributes in bold)	DESCRIPTION OF PRIMARY ATTRIBUTES	INDICATORS	INDICATOR THRESHOLDS	DATA SOURCES (AND RELIABILITY)
ATTRIBUTES ASSOCIATED WITH A SET (RATHER THAN INDIVIDUAL) RIVERS					
Opportunity spectrum	Scarcity of the kayaking opportunity	The availability of similar opportunities influences significance. Opportunities that can be easily substituted (not scarce) are less valued than those that are scarce.	Expert Panel estimate (3-point rating scale): 1=Not scarce 2=Regionally scarce 3=Nationally scarce	High: Nationally scarce (score: 3) Medium: Regionally scarce (score: 2) Low: Not scarce (score: 1) Opportunities that are common in the region, but scarce nationally or internationally are classed at the higher threshold.	Expert Panel estimate (good)
	Connectedness – suite of kayaking opportunities	See Step 9			
ATTRIBUTES ASSOCIATED WITH FUTURE USE					
Recreation opportunity	Potential future kayaking use - avoid precluding future uses	See Step 9			

APPENDIX 3: ASSESSMENT OF INDICATORS BY SMARTA CRITERIA

Indicator	Specific	Measurable	Achievable	Relevant	Timely	Already in use
Perception of scenic attractiveness	Yes	Kayakers' response to rating scale question	Expert Panel estimate; ideally survey kayakers	Contributes to quality of kayaking experience	No data available	Yes - used in recreation surveys
Perception of wilderness character	Yes	Kayakers' response to rating scale question	Expert Panel estimate; ideally survey kayakers	Contributes to quality of kayaking experience	No data available	Yes - used in recreation surveys
Density of high quality hydraulic features	Yes	Kayakers' assessment	Expert Panel estimate; ideally survey kayakers	Whitewater kayaking experience dependent on quality of whitewater	No data available	No
Flow reliability (% of time river is kayakable)	Yes	Flows data assessment; kayakers' assessment	Flow data could be used in future; kayakers' assessment	Relates to opportunity to kayak	Flow data available but assessment not done; Expert Panel assessment	No
Number of users (kayaker days p.a.)	Yes	No. kayaker days	Expert Panel estimate; ideally count kayakers	Use implies value	No data available	Yes - used in recreation surveys
User catchment (home district/region)	Yes	Kayakers' response to home location question	Expert Panel estimate; ideally survey kayakers	Greater distance from home implies higher value	No data available	Yes - used in recreation surveys
Scarcity of kayaking experience	Yes	Rating scale	No data available	Indicator of significance	No data available	Yes - used in previous significance assessments

APPENDIX 4: SIGNIFICANCE ASSESSMENT CALCULATIONS FOR WHITEWATER KAYAKING (STEPS 1 AND 5-8)

Step 1: Define river segments						Step 6A: Apply indicators								Step 6B: Apply thresholds								Step 8: River value				
Map ref no.- Fig 2 and Fig 3	River code no.	River	Start_reach	End_reach	Whitewater grade	Perception of scenic attractiveness (rating scale)	Perception of wilderness (rating scale)	Density of quality hydraulic features (rating scale)	Flow reliability (% of time river kayakable)	Ease of access (mode)	Number of users (kayaker days p.a.)	User catchment (home district/region)	Scarcity of kayaking opportunity (rating scale)	Scenic attractiveness	Perception of wilderness	Density of quality hydraulic features	Flow reliability	Ease of access	Number of users	User catchment	Scarcity of kayaking opportunity	Sum Weights (with access)	Sum Weights FINAL (without access)	River rank FINAL (without access)	River kayaking value (Step 8B)	Comments
23	214170	Mohaka	Te Hoe confluence	Willow Flat	4	5	4	4	100	4	500+	5	3	3	3	3	3	3	3	3	3	24	21	1	High	Only big, powerful HB river section. National/international reputation/status. Broad base appeal. Reliable, high quality of experience at any flow. A "milestone" run defining "expert paddler". "Destination section" - people will travel for this.
22	214040	Mohaka	Everetts	Te Hoe confluence	3,4	4	4	3	100	4	500+	4	3	3	3	2	3	3	3	3	3	23	20	2	High	"Stepping stone" section defining graduation from beginner to intermediate kayaking ability.
2	214040	Ruakituri	Upper (National Park)	above Mangatahae Stream	4	4	5	4	100	2	<100	4	3	3	3	3	3	1	1	3	3	20	19	3=	High	Starts within National Park - precludes fly-in so long walk in to waterfall. Blue duck sanctuary. Listed in Charles guidebook NZ <i>Whitewater</i> . Recent increase in popularity - blog site feature.
n/a		Mohaka (combined)	Mohaka (Poronui)	Willow Flat	2,3,4	5	4	3	100	4	>100<500	4	3	3	3	2	3	3	2	3	3	22	19	3=	High	Mohaka assessed cumulatively as nationally scarce, multi-day experience, especially of this length (approx. 4 day). Diversity of landscape: "pristine wilderness to forestry and farming." Also important for rafting (not assessed).
18	214042	Mohaka	Taharua confluence	Pakaututu Rd	3	5	5	3	90	1	>100<500	4	3	3	3	2	3	1	2	3	3	20	19	3=	High	Poronui drive-in access restricted, so long walk or heli. Attracts users from HB, Taupo and rest of NZ. Important commercial use, including rafting. Hot pools and campsite are attractive features.
n/a		Ngaruroro (combined)	Boyds (airstrip)	Whanawhana	3+	5	5	4	60	1	>100<500	4	3	3	3	3	2	1	2	3	3	20	19	3=	High	Assessed cumulatively as a nationally scarce, multi-day experience alongside e.g. Mohaka, Motu, Rangitikei, Landsborough, Clarence. Upper= 3 day experience - can't get out. Lower=1 big day/overnight. Important rafting river (not assessed).

33	214042	Ngaruroro	Kuripapango bridge	Whanawhana	3+	4	5	3	90	4	>100 <500	4	3	3	3	2	3	3	2	3	3	22	19	3=	High	Paddled by large groups (e.g. schools - up to 50 people). Well-documented trip (day or overnight). Dense hydraulic features in places.
13	214160	Te Hoe	Upper (Ngatapa Station)	Huatapu confluence	4	5	4	5	60	3	<100	4	3	3	3	3	2	2	1	3	3	20	18	4=	High	An attractive combination of high scenic value and technical challenge. Includes impressive lower gorge. Rockhunters Hut to Ngatapa Station not assessed due to forestry access restrictions.
31	214160	Ngaruroro	Boyds (airstrip)	Kuripapango camp ground	3	5	5	4	25	1	>100 <500	3	3	3	3	1	1	2	3	3	19	18	4=	High	Starts in Forest Park. Airstrip provides plane access. Needs rain for upper section paddling. Big river terraces and wilderness experience. School trips. Featured online at <i>Bliss-Stick.com</i> .	
6	218000	Waikaretaheke	Piripaua	Terapatiki, junction SH38 & Waihi Rd	3	3	2	5	10	4	>100 <500	4	3	2	1	3	1	3	2	3	3	18	15	7=	High	Hydro-release. Not wilderness - roadside. Has been site for slalom and downriver national selections (only a few sites nationally e.g. 2-3 South Island slalom sites). Previously on international circuit. User numbers variable.
3	214160	Ruakituri	Papuni	Puhoro bridge	4	4	3	4	80	4	>100 <500	4	2	3	2	3	3	3	2	3	2	21	18	4=	Med	Data deficiency - only one panellist had padelled section. In Charles guidebook <i>NZ Whitewater</i> . Interesting rock formations (as scenery). Tight, technical, challenging run. Not good slides.
20	218350	Mohaka	Mountain Valley (SH5)	Glenfalls	2	3	3	3	100	4	500+	4	2	2	2	2	3	3	3	3	2	20	17	5=	Med	Slalom course used nationally. Important multi-sport training ground (e.g. coast to coast). Lots of features for entry level kayakers.
21	218350	Mohaka	Glenfalls	Everetts	2	3	3	3	100	4	500+	4	2	2	2	2	3	3	3	3	2	20	17	5=	Med	Some paddlers get out at Bridgets (approx. 1km upstream). "Organ pipes" are interesting scenic feature.
12	218000	Hautapu	Upper (Ngatapa Station)	Te Hoe confluence	3	4	5	4	100	3	<100	2	2	3	3	3	3	2	1	2	2	19	17	5=	Med	Spring-fed, consistent flow. Helicopter or 4WD + long walk in through Ngatapa Station (access issue).
8	218000	Waiau	Upper (heli-access)	end Putere Rd	4+	4	5	3	80	1	<20	2	2	3	3	2	3	1	1	2	2	17	16	6=	Med	Great potential for kayaking, but difficult access. Multiple stops.
17	218000	Taharua	Poronui (Clements Rd)	Mohaka confluence	3	4	4	3	70	4	<100	3	2	3	3	2	3	3	1	2	2	19	16	6=	Med	Access needs clarification. Entry-point for Mohaka multi-day. Location draws from Hawke's Bay and Taupo.
19	218000	Mohaka	Pakaututu Rd	Mountain Valley (SH5)	2,3	3	3	4	100	4	>100 <500	3	2	2	2	3	3	3	2	2	2	19	16	6=	Med	Attracts users from Hawke's Bay, Taupo and rest of NZ. Important commercial use, including rafting.
32	218000	Ngaruroro	Kuripapango camp ground	Kuripapango bridge	2+	4	2	3	100	4	500+	2	2	3	1	2	3	3	3	2	2	19	16	6=	Med	Very accessible. Used by schools. Camping ground adds to popularity. Park'n'play on big loop. Cumulative value as part of multi-day on this significant training river.
36	218000	Taruarau	Napier Taihape Rd	Ngaruroro confluence (see comment)	3,4	4	4	3	60	4	<100	4	2	3	3	2	2	3	1	3	2	19	16	6=	Med	End of Taruarau River is not end of run - extends to Whanwhana on Ngaruroro. 60% flow reliability in winter, but snow means spring and autumn paddling favoured. Wellington and Palmerston North users. Access issue prevents section split.
4	218162	Ruakituri	Puhoro bridge	Erepeti Rd bridge	3	3	2	3	90	4	>100 <500	4	2	2	1	2	3	3	2	3	2	18	15	7=	Med	Data deficiency - Panel had driven-by but not paddled. Has greater use than reach above. Ruakituri and Waikaretaheke attract joint trip, with kayaker selection based on technical ability.
16	218160	Waipunga	Tarawera	Mohaka confluence	3+	3	4	3	100	4	>100 <500	3	1	2	3	2	3	3	2	2	1	18	15	7=	Med	Vandalism an issue for put in or take out either road end.

14	218160	Te Hoe	Huatapu confluence	Mohaka confluence	4	3	3	3	100	3	<100	2	2	2	2	2	2	3	2	1	2	2	16	14	8	Med	Difficult access precludes greater attention. Short trip. River goes through cave (can't paddle in high flow).
1	218200	Hangaroa	nr Mangapiopio Stm confluence (Ruakaka Rd)	Te Reinga	2	3	3	2	100	4	<100	2	2	2	2	1	3	3	1	2	2	16	13	9=	Med	Data deficiency - not well known by panel. Equi-distant for Napier and Gisborne users. Crosses regional boundary. Spectacular falls, but not seen while kayaking. Shelf paddling (mudstone geology) raises scarcity value. Gorge section. Often silty.	
15	218200	Waipunga	Waipunga Falls	Tarawera	3	3	3	3	70	4	<100	3	1	2	2	2	3	3	1	2	1	16	13	9=	Med	Choice if put in points. Runs close to road. Popular from Taupo. Potential log jams.	
5	218000	Waikaretaheke	Whakamarino	Piripaua	4	2	2	5	10	4	<100	4	2	1	1	3	1	3	1	3	2	15	12	10=	Med	Can only paddle at 2 hydro dam releases/year, but know when flows occur. Slalom and downriver site for NZ selection and events. One of few NZ dam-controlled runs. Scenic in "Cotswolds" way. Continuous paddle is like S. Island river with 2 sets of rapids.	
27	231000	Tutaekuri	Donald (Lawrence Hut)	Dampney Rd, nr Dartmoor	3	3	3	3	50	4	<100	2	1	2	2	2	2	3	1	2	1	15	12	10=	Med	Data deficiency - not well known by panel. Rocky gorge section.	
9	228000	Waiau	end Putere Rd	Waireka Rd bridge	2	2	3	3	80	4	<100	2	1	1	2	2	3	3	1	2	1	15	12	10=	low	Data deficiency - not well known by panel. Used by school groups.	
10	230000	Waiau	Waireka Rd bridge	Waikaretahek e confluence	2	2	3	3	80	4	<100	2	1	1	2	2	3	3	1	2	1	15	12	10=	low	Data deficiency - not well known by panel. Duplicated scores for reach above.	
24	231000	Mohaka	Willow Flat	Mohaka viaduct	2	2	2	2	100	4	<100	2	1	1	1	1	3	3	1	2	1	13	10	11=	low	Water Conservation Order ends at Willow Flat. Previous proposal to dam was shelved.	
37	231000	Makaroro	end Wakarara Rd	Waipawa confluence	2	2	2	3	60	4	<100	2	1	1	1	2	2	3	1	2	1	13	10	11=	low	No comments.	
7	231200	Waikaretaheke	Terapatiki, junction SH38 & Waihi Rd	Waiau confluence	2,4	2	2	3	10	4	<100	3	1	1	1	2	1	3	1	2	1	12	9	12=	low	Farm country. Willows detract from experience. Tends to be an "add-on" when in area for other reasons.	
26	232102	Esk	End Ellis Wallace Rd	SH2 bridge	2	2	2	2	50	4	>100 <500	1	1	1	1	2	3	2	1	1	1	12	9	12=	low	School use (e.g. through Kiwi Adventure).	

"BOTTOM LIST": Flatwater used by whitewater kayakers (e.g. slalom, park'n'play, training etc)

11	214000	Wairoa	Frasertown	Wairoa estuary
25	218000	Mohaka	Mohaka viaduct	Mohaka estuary
28	230000	Tutaekuri	Dampney Rd, nr Dartmoor	Puketapu
35	231000	Ngaruroro	Fernhill	Waitangi
34	231000	Ngaruroro	Whanawhana	Fernhill

Ranking rules:

"HIGH" kayaking value river = scored a 3 for scarcity of kayaking opportunity AND scored at least three 3s across all indicators (excluding Access)

"LOW" kayaking value river = scored a 1 for scarcity of kayaking opportunity AND scored at least three 1s across all indicators (excluding Access)

"MEDIUM" kayaking value = all remaining rivers.

38	232000	Tukituki	Red Bridge	Black Bridge
30	229000	Ahuriri	Pandora Pond	Pandora Pond
29	230000	Tutaekuri	Puketapu	SH2 Expressway
39	233000	Maraetotara	Ocean Beach Rd	Clifton

Colour Code Key (as at 28 May 2012)

Significance thresholds (highlighted columns)

Green	High = National
Blue	Moderate = Regional
Yellow	Low = Local

Misc (highlighted rivers)

Pink	Rivers overlap with neighbouring council
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Data reliability (font colour)

Blue/Purple	Less reliable data
Red	Data checked by Expert Panel and has been adjusted

APPENDIX 5: OTHER FACTORS RELEVANT TO THE ASSESSMENT OF SIGNIFICANCE FOR WHITEWATER KAYAKING (STEP 9)**Access**

Access is a prerequisite for kayaking and will influence the pattern of use. Lack of legal or practical access may limit or completely restrict use, even to otherwise suitable sites. Difficulties in using access as a primary attribute for kayaking value are discussed in Steps 3 and 4 of the report.

Connectedness – the suite of kayaking opportunities in the region

Individual rivers may contribute to a set of values found within a region or nationally – the sum may be greater than the parts. If parts of the collective are compromised, this may act as a tipping point to reduce or negate the value of the collective. For example, Hawke's Bay provides nationally scarce multi- or single-day opportunities on the Mohaka and Ngaruroro Rivers. Collectively, the northern Hawke's Bay rivers may offer an attractive multi-run opportunity. This argument mirrors biodiversity hot spots of endemism – hot spots for whitewater kayaking may occur that require protection.

Users' perceptions of the river's importance (including its status/reputation)

Certain rivers have national or international status (reputation) within the kayaking community. The Panel noted the Mohaka as an example of such a Hawke's Bay river. Increased understanding of users' perceptions is a key requisite to maximise the validity of this type of assessment.

Potential future kayaking use

Kayaking has been subject to a dramatic increase in the type and number of rivers that are able to be paddled in the last 20 years primarily as a result of technological advancements in kayak design and materials. Access may also change. As a result, existing use patterns may be poor indicators of future use value*. Therefore, "future proofing" for potential recreational value is required. Some decisions may inadvertently preclude future recreational options.

*The best example of this phenomenon is the work by Egarr and Egarr (1981). Their assessment of the recreational potential of New Zealand rivers nearly three decades ago does not match current use patterns owing to the sort of factors already outlined.

Existence and option value

Existence value – a river reach may be valued because it has not been paddled or can only be paddled by the elite few who have the technical skill to do so. Option value - for the Hawke's Bay option value is particularly associated with kayakers' aspirations to paddle challenging whitewater river sections, once their kayaking skills have developed to that level.

APPENDIX 6: FUTURE DATA REQUIREMENTS FOR WHITEWATER KAYAKING (STEP 10)

Data need
Testing the attributes identified for whitewater kayaking and identifying their relative contribution to kayaking value
Users' perception of scenic attractiveness
Users' perception of wilderness character
Hydraulic morphological index (for hydraulic density indicator)
Data for flow reliability indicator
Number of kayaker days (by time period over which river is kayaked)
Users' home location
Data for scarcity of kayaking opportunity indicator
Users' evaluation of the overall importance of the river