An assessment of the whitewater recreational values of West Coast rivers – whitewater kayaking

Andy England

LEaP Research Paper No. 2
January 2011
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Land Environment and People Research Paper No. 2
January 2011

ISSN 2230-4207 (Online)
ISBN 978-0-86476-273-3 (Online)

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Acknowledgements

My hosts, Ian Wightwick of DoC and Ken Hughey of Lincoln University, were instrumental in developing this project and very understanding; Liam Anderson at DoC created all my maps and it was great to work with Trevor Johnston. The staff at the RSNZ\(^1\) have been a tremendous support and the scheme itself is amazing: as a teacher, I feel rejuvenated, upskilled and satisfied to have applied my Geography academic background. Shayne Galloway of the University of Otago freely offered great support, as did Kay Booth of Lindis Consulting, whilst Doug Rankin from Whitewater New Zealand shared his depth of experience. Mary Trayes at the West Coast Regional Council was positive and helpful.

Sony New Zealand supplied me with a laptop, camera, GPS and voice recorder. Pyranha Mouldings provided my kayak and Palm Equipment provided my outer wear, with Hydroscapes Safety Gear providing my lifejacket.

\(^1\) The New Zealand Sciences Mathematics and Technology Teacher Fellowship Scheme is funded by the New Zealand Government and administered by the Royal Society of New Zealand
To get down the rivers safely I relied on good teams, and all of these people waited patiently for me while I conducted my work; Eddie Murphy and my brother Kevin particularly.

1 The New Zealand Sciences Mathematics and Technology Teacher Fellowship Scheme is funded by the New Zealand Government and administered by the Royal Society of New Zealand
Summary

This report describes a data resource for decision makers in areas of the West Coast where whitewater kayaking occurs.

Throughout 2010 I collected and processed data for my Royal Society of New Zealand Awarded Teacher Fellow project “An Assessment of the Whitewater Recreational Values of West Coast Rivers”. The data was collected under the supervision of Ian Wightwick, Technical Support Supervisor Visitor and Historic Management, Department of Conservation (DoC), Hokitika, and Ken Hughey, Professor of Environmental Management, Department of Environmental Management, Faculty of Environment, Society & Design, Lincoln University.

I describe and evaluate the methodologies chosen. I discuss the meaning of value in a recreational context. I summarise the key learning points from this research and suggest areas for further work. I describe how to use the data resource, which is set out in the Appendices and attached in electronic form on a DVD. The resource contains:

- River trip reports for 31 rivers. These reports cover logistics; descriptions of whitewater technicality, river scenery and wilderness feel; issues for land managers and rescue managers; a general river summary; representative photographs and results from the West Coast Whitewater Kayaking Survey 2010 with commentary
- Photo galleries for 31 rivers. The jpg photos are mainly geotagged (the latitude and longitude of where the photograph was taken can be found in the file metadata)
- Reports from the West Coast Whitewater Kayaking Survey 2010, including my commentary. The reports cover overall values associated with rivers; graphs of the specific ratings of West Coast rivers; open descriptions of the value of West Coast rivers to survey respondents and a demographic profile of the survey respondents.

The research shows that, as a whole, the rivers of the West Coast region are the most highly valued in New Zealand and amongst the most highly valued in the world by whitewater kayakers. To whitewater kayakers around the world, the West Coast region is characterised by its rivers and its rivers are characterised by their high levels of challenge, scenery and wilderness.

In comparison to other regions of NZ and the world, the West Coast region has a very high density of rivers that offer great whitewater challenge, inspiring river scenery and a strong wilderness feel. Added to this are such qualities as cleanliness and clarity of water, a range of access arrangements including helicopter access, geographic closeness of rivers meaning low travel times between rivers, and a wider regional experience that offers additional social attractions.

That so many rivers of the West Coast are valued so highly does not belittle their assessment, but truly represents their remarkable qualities. It makes it impossible to segregate a common set of top rivers, but a general trend is that northern Westland has the highest concentration of top rated rivers for whitewater challenge, with very high scores for scenery and wilderness; while northern Buller and South Westland have small
concentrations of rivers top rated for wilderness and scenery with high ratings for whitewater challenge.

The main whitewater kayak users of West Coast rivers are highly specialised and experienced, which reflects and is reflected by the high proportion of more challenging rivers, yet the region is also held in high regard as a destination to aspire to by users of lower ability. Of interest is the demographic profile of survey respondents, showing that most whitewater kayakers on the West Coast are male, of widespread ages, educated to bachelor’s degree or beyond, professionally employed with incomes above national averages.

Picture 1: a humbling experience, deciphering the puzzle of entering Omatane Canyon on the Hokitika river.
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(In envelope) Fold out map of river regions of the West Coast as defined by whitewater kayaking character
(In envelope) DVD of electronic resources:
- Geotagged photo galleries
- River trip reports
- Google Earth survey results file
- Topo map tracks
1 Introduction

1.1 Author’s background

I came to the West Coast of New Zealand in 1994 as part of a whitewater kayaking ‘World Tour’. I knew from then I wanted to return and did so in 2001, settling permanently. I have kayaked whitewater around the world since 1985. I have a passionate connection with New Zealand’s West Coast rivers, in particular their upper reaches, that I could write about lyrically. I’ve also watched as many of my friends from Scotland and other parts of New Zealand have settled here over the last few years, for much the same reasons as me: we love the rivers and then found fantastic communities which cement our connection and commitment to the region.

I have a BSc in Physical Geography from the University of Aberdeen, Scotland, and a postgraduate teaching qualification from the University of Edinburgh, Scotland. I taught Geography in Aberdeen for nearly 5 years. I am currently a full time teacher of Geography and Deputy Principal at Greymouth High School.

I am a member of the Tasman Whitewater Search and Rescue team and have been used as an expert witness for the New Zealand Police in cases of river fatalities. I have been involved in advocacy for river conservation on the basis of recreational use.

1.2 Context and previous work

It wasn’t until 2005 when the Arnold River was threatened with dewatering for hydro electricity generation, and I became involved in the kayakers’ defence of that river, that I realised how little written material was available about kayakers’ use of rivers. Advocates had to scrabble for evidence to support their arguments, and learn what was important to decision makers. Recreation consultants used Graham Charles’ Guide to New Zealand Whitewater in a way for which it was never intended, referred to Egarr and Egarr’s work of 1981 and the New Zealand Canoe Association’s (NZCA) river survey of 1991, but the world of whitewater kayaking had changed so much since then that their quotes were misleading, taken so far out of the modern context.

The West Coast Regional Council, along with the Energy Efficiency Conservation Authority (EECA) published a “Renewable Energy Assessment” in 2008 which clearly stated that West Coast rivers were an enormous source of potential hydro generation and that this was the most favourable method for power generation on the West Coast. For anyone who cares about the natural wonders of these rivers, it was dreadful reading. But the paper’s intention was to set out as fact what the resource base was, and that was what inspired me to research and present a recreation assessment.

The aim of my project, “An assessment of whitewater recreational values of West Coast rivers” was to create a current database of what West Coast rivers mean to whitewater recreational users. These users could cover fishing, rafting, tubing, kayaking, canoeing and
even “bugging”, but in my work I focus on kayaking/canoeing. This resource has been developed for use by Department of Conservation decision makers but is available to anyone who has an interest in the management of West Coast rivers for the well being of its people.

This report is not an academic paper. It is based on a range of data that will be described openly and are open to scrutiny. The overall aim of this report is simply to provide the Department of Conservation – and anyone else who may need user data on West Coast rivers – with a set of current data about whitewater kayakers/canoeists. One particular challenge was to take subjective views and create an objective resource. I have not made recommendations as I see this data set’s purpose as contributing to decision makers’ tools.

I spent some time thinking about values and significance tests. In this context, “value” does not refer to economic or dollar value, but to the aspects of an environment that are important to people. I have not offered an overall value as I do not think that one can be given accurately, even for such a specific user group as ‘whitewater kayakers’. I do, however, speculate on the overall value of West Coast rivers in the conclusions section and try to define my view of the factors that combine to define ‘value’ or ‘significance’ in relation to whitewater kayakers’ use of rivers.

There has been academic work done in this area, and I drew notably on three pieces: “A Significance Assessment Method for River Values” (Ken Hughey, Kay Booth, Neil Deans, and Mary-Anne Baker, 2009), “New Zealand Recreational River Use Study: Specialization,
Motivation and Site Preference” (Shayne Galloway, 2008) and the “NZCA River Use Survey” (New Zealand Canoeing Association, 1991).

Hughey et al’s 2009 River Values Assessment Method (RiVAS) involves expert groups allocating scores which are then processed using multi criteria analysis to produce an overall ranking for the rivers in a region. The ranked list is then broken into overall importance levels. This method has the strength of being relatively easy to repeat by regional councils, for which it is aimed, and applicable across various river-based activities. In my opinion, the numerical base for the system offers a limited insight into a region’s river activity, albeit useful and a vast improvement on the knowledge that usually exists in organisations such as regional councils. Where applied, it is also useful in that it is current and (if staff are involved directly) helps staff to increase their understanding of relevant issues for river users.

Galloway’s New Zealand Recreational River Use Study is a substantial and current offering that helped to affirm the focus of my questioning in the West Coast Whitewater Kayaking Survey. Galloway asked users about the aspects of their experience that they valued: social aspects are highly important, as well as water qualities, scenery and wilderness. For the purposes of my study - for land managers – I judged social aspects to be intrinsic and largely beyond the direct control of land managers.

The NZCA River Use Survey and the current Whitewater New Zealand Conservation Policy refer to four factors as being the most important for whitewater kayakers: closeness to where one lives, scenic beauty, wilderness feeling and degree of kayaking challenge. In the 1991 survey, it was also asked what people considered the overall importance of a river to be.

Picture 3: social factors are important to whitewater kayakers but beyond the direct control of land managers; Dave Ritchie and Eddie Murphy after the Waipara.
1.3 Geographic area covered by this report

Map 1 Boundaries of this study

Map of geographic area covered by this report showing selected rivers

- West Coast Tai Poutini Conservancy boundary
- West Coast towns
- Surveyed rivers

Unnamed rivers were not covered by this survey
There are many ways to assess recreational value. I placed importance on seeing and experiencing the West Coast’s rivers - and therefore the recreational experience – myself. This allowed me to:

- view the rivers and their environments with values assessment in mind
- observe kayakers’ behaviour informally, with values assessment in mind
- collect logistical data directly
- make a geotagged photographic record
- compile current trip reports with notes for a range of potential users
- publicise to current river users the survey I had planned for winter.

To do this, I liaised with known and tourist kayakers to arrange teams for river trips. I then took part as a team member for the trip, although I did brief others about my work which had an impact on the dynamics of the trip (mainly by slowing progress as I got out of my boat to take photographs and check locations). I developed a specific safety plan. Given the seasonal pattern of river use and tourist arrivals, I covered as many rivers as possible in the late summer and autumn of 2010, then accepted a delay until spring 2010.

There was also a need for information about and from other users, which it was decided to gather using an online survey.

Picture 4: helicopter access is very much part of the attraction of kayaking on the West Coast, and in many cases the only way to access rivers. Five minutes of noise, then you are on your own with only one way home. Kokatahi Helicopters.
2.1 Geotagged photos
Photographs were taken with the aim of representing the character and key features of each river, from a whitewater kayaker’s eye. This covers water qualities such as colour and clarity; river landscape features such as boulders and gorges; valley landscape features such as the wider view from the river. I also took photos of the kayaking activity itself, aiming to exemplify the typical style of kayaking for that river.

I mainly used a Sony HX-1 digital camera. Where possible, the photos were geotagged (latitude and longitude stored as metadata) using a Sony GPS. This system updates and records location using as many satellites as possible every 15 seconds, offering a digital track: the camera and GPS are synchronised and the memory card inserted to the GPS unit after the trip, which then calculates and imprints each photo’s location.
2.2 River trip reports
I decided on useful headings with my DoC host, Ian Wightwick, then made notes about river trips as soon as practicable after the event, in a diary. The river trip reports themselves were then written in full with checks on location data using Map Toaster software and Google Earth. See sample river trip (Arahura Milltown Gorge, three pages) below.

Appendix 3 contains river trip reports on the following rivers (sections):

Arahura (Newton Creek)
Arahura (Milltown Gorge)
Arnold
Buller (Earthquake)
Cascade (Gorge)
Crooked (Upper and Lower)
Grey (Upper Grey)
Hokitika (Serpentine and Kakariki)
Kakapotahi (Upper and Lower)
Karamea (Venus Hut down)
Kokatahi (Crawford Junction)
Landsborough (Toe Toe Flat)
Makawhio
Martyr (Monkey Puzzle Gorge)
Mikonui
Moeraki
Mokihinui (Johnson Hut, North Branch, The Forks)
Moonlight
Perth (Scone Hut, Five Finger Gully)
Styx (Tyndall Creek)
Taipo (Julia Hut, Seven Mile)
Toaroha
Totara
Turnbull
Waiatoto
Waimangaroa
Waipara
Waitaha
Wanganui (Upper and Adams confluence)
Whitcombe (Cropp)

These reports are also included in electronic form (pdf) in the attached DVD.
<table>
<thead>
<tr>
<th>River report form</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Andy ENGLAND</strong></td>
</tr>
<tr>
<td>River (section)</td>
</tr>
<tr>
<td>Locations (latitude and longitude of put in and take out)</td>
</tr>
<tr>
<td>On this trip, put in was at the ‘Arahura playhole’ through a farmer’s paddock at approx: 42° 48.730’S 171° 12.942’E 543585</td>
</tr>
<tr>
<td>Access description</td>
</tr>
<tr>
<td>Land status (banks)</td>
</tr>
<tr>
<td>Date kayaked (for this report)</td>
</tr>
<tr>
<td>Group members (on this trip)</td>
</tr>
<tr>
<td>Description of whitewater kayaking technicality (inc. grade and style of kayaking, volume on day, flow requirements and estimate of reliability)</td>
</tr>
<tr>
<td>Description of water landscape (inc. water quality and clarity, river bed features)</td>
</tr>
<tr>
<td>Description of valley landscape from river (inc. gorges and views from river, types of vegetation)</td>
</tr>
<tr>
<td>Description of degree of wilderness feel (inc. presence or absence of human influence, remoteness)</td>
</tr>
<tr>
<td><strong>Notable flora and fauna (eg blue duck)</strong></td>
</tr>
<tr>
<td>-------------------------------------------</td>
</tr>
<tr>
<td><strong>Description of overall character of river</strong></td>
</tr>
<tr>
<td><strong>Distinctive features of river trip (key words)</strong></td>
</tr>
<tr>
<td><strong>Info for land managers</strong></td>
</tr>
<tr>
<td><strong>Info for rescue managers</strong></td>
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<tr>
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<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Any other notes</strong></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

The Arahura ‘playhole’

Students upstream from the gorge
Statistics from 2010 West Coast Whitewater Kayaking Survey

% column graphs showing respondents’ scoring of river attributes

Arahura River
Milltown Gorge

Importance: 1=not, 5=extremely
Challenge: 1=none, 5=only on a good day
Scenery: 1=unattractive, 5=inspiring
Wilderness: 1=no wilderness, 5=pristine, remote
Flow: 1=unreliable, 5=very reliable

The bigger the block, the more people scored that number

River users by country (pie) and NZ region (column):
Arahura Milltown Gorge

<table>
<thead>
<tr>
<th>Australia</th>
<th>Canada</th>
<th>SUI</th>
<th>UK</th>
<th>USA</th>
<th>NZ AKL</th>
<th>NZ BOP</th>
<th>NZ Wgtn</th>
<th>NZ Wgtn</th>
<th>NZ Otago</th>
<th>NZ Slnd</th>
<th>NZ WC</th>
</tr>
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Numbers

<table>
<thead>
<tr>
<th>Total number trips recorded</th>
<th>431</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of respondents for this section</td>
<td>94</td>
</tr>
<tr>
<td>Mean number trips per person</td>
<td>4.6</td>
</tr>
</tbody>
</table>
2.3 RiVAS
The Lincoln University/LEAP RiVAS significance assessment method, already discussed briefly, relies on an expert panel to quantify values identified by another expert panel. This work was conducted in late 2009 and is available online (follow hyperlink above).

![RiVAS spreadsheet screenshot](image.png)

Picture 6: screenshot showing draft RiVAS spreadsheet for whitewater kayaking on the West Coast.

2.4 West Coast Whitewater Kayaking Survey 2010 (The Survey)
The principal method I used for gathering other kayakers’ values was a survey. The West Coast Whitewater Kayaking Survey 2010 (hereafter referred to as The Survey) was developed with input from Ian Wightwick, Whitewater New Zealand, Lincoln University staff and friends. It was checked and approved by Lincoln University’s Human Ethics Committee.

The Survey was online only, using Qualtrics software through Lincoln University. Access to the survey was only through a blog I created (www.westcoastnzriverstudy.blogspot.com).

It was promoted online using emails and a Facebook account I created. I then joined various online whitewater kayaking forums from around the world ², to inform their users of The Survey. I emailed media releases to magazine³ editors who included editorial about the survey (both online and in print). Finally, I did presentations to several audiences⁴ about my project with reference to the online survey.

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² Boatertalk, USA; Boof, USA; Playak, EU; Canoe and Kayak, UK; Rivers, NZ; UK River Guide, UK
³ Rapid Media, Canada; Canoe and Kayak, UK; Kanu Magazin, Germany; Cumec, NZ
⁴ Tai Poutini Polytechnic Outdoor Recreation programme, Greymouth; Christchurch Polytechnic Outdoor Recreation Programme, Christchurch; Whitewater Canoe Club, Christchurch
The Survey had three main sections:

1. General river values rated (based on values used in the NZCA 1991 survey, RiVAS and endorsed by Galloway, 2008)

2. Specific rivers rated by people who had kayaked them using the above values, to get indicative user numbers and relative values for each river; an open question asking what West Coast rivers mean to participants, to gain qualitative insight; a question about a river itinerary to try to find out about river inter-connectedness

3. Participant demographic data, to find out who was kayaking the rivers and particularly where they came from as this was accepted as an indicator of river significance; this data also provided a profile of the participants which helped to evaluate the answers to the other questions.

2.5 I had also planned to use interviews of relevant people to add further qualitative data. I planned interview schedules and submitted an application to Lincoln University’s Human Ethics Committee, which requested further information, but I ran out of time. I had planned to interview:

- Whitewater river explorers who have made history (Graham Boddy, Gary Rae, Hugh Canard, Bruce Barnes, Tony Ward-Holmes, Graham Charles, Gareth Fryer, Ollie Koehler)
- Helicopter pilots, particularly Bruce Dando
- Campground owners and publicans (particularly Hokitika Campground and Les Lyes of the Mahinapua Hotel)
- Recent migrants to Hokitika and Neil Gillespie as a lifelong West Coaster and kayaker.
Picture 8: Dave Ritchie demonstrating perfect technical grade 4 whitewater kayaking on the Mokihinui River.

Picture 9: Dave Ritchie demonstrating perfect technical grade 4 whitewater kayaking on the Arahura River.
3 Assessment of data gathered

Having the time luxury to take such a holistic approach to assessing a region’s significance has, in my opinion, resulted in a wealth of data that is new and, hopefully, useful.

3.1 Geotagged photos
The photo galleries are irrefutable evidence of what exists in the whitewater rivers of the West Coast. It is impossible to say they are fully representative, as:

- I tended to take fewer photos of flat water sections, due to a natural interest in whitewater
- 2009 was La Nina year with consequent low flows which affected the visual appearance of some rivers (for example Turnbull)
- Photographs can be set up in various ways to represent what the photographer wants to show, allowing an element of subjectivity.

The latitude and longitude of the photos, stored in their metadata, is generally accurate to around 10m, but in some cases the GPS unit ‘assumed’ my location (seemingly by taking 2 known points and assuming my track between them). This happened where satellites were out of reach or when the GPS unit batteries failed before I could replace them. There is no way of knowing or labelling which photos this applies to so some common sense checks should be made when using the coordinates. There are also two rivers, the Cascade and Buller Earthquake, where the GPS unit was either not with me (Cascade) or set to the wrong time (Buller Earthquake ‘Gunslinger’ and upstream).

3.2 River trip reports
The headings of the reports were set up to be as objective as possible but in any description of landscape there is an element of subjectivity. In this case, it could be argued that that is necessary as, in part, these reports were about describing the landscape as a whitewater kayaker sees it which, it is here accepted, may be different than how someone else, for example a tramper, may see the landscape. A sample river trip report is attached in section 4.2 (pages 27-29).

3.3 RiVAS
There has been a lot of evaluation of the RiVAS method by people far more educated in these matters than me. Most of this is included in the reports, available online (see references).

The West Coast report was the first, trial, application of this method to whitewater kayaking (it had previously been applied to salmonid angling). From my experience this year, I see the following issues:

- The expert panel made a few mistakes (valuable sections omitted and at least one river, the Cascade, scored incorrectly) which could in part be due to trying to cover
so many rivers in one day, a problem made worse by the West Coast region having so many rivers

- There was no written descriptive overview for the region (this has since been amended in the method)
- The headings were not all agreed upon and therefore may have been interpreted inconsistently (this has since been amended in the method)
- The overall product, a set of numerically ranked rivers, is of limited depth and value on its own; it requires further examination to be used as a decision making tool but could be useful for a strategic planning tool
- The West Coast Regional Council, for whom this work was done and who had a staff member involved, appear to have done nothing with the work to date.

That said, the method even in this first iteration did provide a list that could be seen as the “crown jewels” of West Coast whitewater and the lower ranked rivers generally are seen as less important by most people (but note, importantly, that they may well be valued highly by a few people).

Application of the RiVAS method is achievable by regional councils and cost-efficient, in that it takes around 3-5 staff days to conduct for a region. For that effort, the technique gives an overview of a river-based activity that will assist effective planning by:

- providing new understanding
- indicating ‘hot spots’ and opportunities when compared to other activities
- building relationships with interested parties in the community.

3.4 West Coast Whitewater Kayaking Survey (the Survey)
See Appendix 2. This is the part of my assessment that requires the greatest evaluation. The Survey produced a huge amount of data, enabling a range of analyses that have not all been conducted and would require their own evaluation if and when that is done. I will focus this evaluation on the gathering of the data, as my analysis is basic (calculating means, percentages and graphing).

3.4.1 Distribution of The Survey
The use of an online survey creates an immediate sampling bias, in that there are inevitably a few people who do not use computers or the internet (I know of at least one such person who has been a prolific whitewater kayaker on the West Coast). However, it was felt from observation that:

- almost all kayakers would be internet users
- face to face surveys would be extremely difficult to gather as kayakers could be anywhere and, even if I was to meet them they are likely to be too tired or nervous and it is likely that I would have an influence on their answers
- written surveys would require physical addresses and a large infrastructure as well as cost to conduct.

Given the above, I decided social networking was the most practical way to distribute the survey.
Using social networking was new to me, so I did not have a well established Facebook page and this initially limited the dissemination of information about The Survey. However, leaning on well established Facebook personalities (for example Ben Brown) did get The Survey worldwide publicity linked to my blog. Worldwide magazine (including ‘e-zine’) coverage, as well as online forums, will have added a few surveys, although I think it is unlikely that this was great in effect: only three German kayakers completed The Survey despite Kanu Magazin of Germany offering substantial editorial. I have kayaked on the West Coast over the last nine years with at least 20 German kayakers and emailed one directly about The Survey.

One of the difficulties of using social networking and an online survey is knowing how effective the component parts of marketing The Survey have been. I found no way of ascertaining that and for survey efficacy it would be worthy of study in its own right.

Talking about my project in person appears to have been very effective in gaining survey numbers: following talks that I did in Greymouth and Christchurch, completion rates surged. This did, however, coincide with the last 10 days of The Survey being active so it is impossible to say whether the talks were causal. Assuming they were, in part, this leads to a potential sampling bias which may be reflected in the numbers of completed surveys from West Coast and Canterbury (although that was always to be expected).

One other difficulty faced and not solved by The Survey was time of year, 1 July to 12 August 2009: southern hemisphere winter may mean kayakers here are more likely to be in front of a computer with some time spare, but that is less likely in the northern hemisphere and that may well be reflected by the results (28% from overseas). However, with no ability to track percentage of survey returns, and no actual river visitor numbers to correlate to survey results, it is impossible to know how accurately reflective a sample The Survey achieved. The Survey did achieve 260 completed surveys, from 443 people who opened The Survey.
3.4.2 The questions in The Survey

Questions in The Survey were pretested using colleagues and friends. A full trial was not run as time was limited and the number of potential respondents is very limited: I was cautious of survey fatigue.

The overall aim of the survey was:

- To test and help to calibrate the river attributes used in the 1991 survey and RIVAS
- To gauge usage levels of specific rivers as well as mean scores for their attributes, rather than relying solely on my field observations
- To try to look for patterns in connectedness between rivers
- To test respondents’ attitudes to West Coast rivers
- To gather data for possible cluster analysis to identify types and preferences of whitewater kayakers.

Question 1, asking participants to score aspects of their kayaking experience, was straightforward and clearly worded. It gained good results and received no queries.

Question 2, asking participants to score individual river sections under seven categories, had several issues:

- Number of times kayaked had to be a total figure – number of times ever kayaked in a person’s life – which prevents reporting an annual figure. However, it was decided that this was a more useful number as asking about “last season” would lose valuable usage information (not being able to report on rivers kayaked in the past but not kayaked last season)
- Kayaking season, or when the respondent kayaks the river in question, was presented as a 1-5 response alongside Likert values for other attributes, despite not being a linear value, potentially leading to misinterpretation by participants (although results are what I would expect from my knowledge)
- Quality of whitewater challenge was, in my mind, the most misleading of headings. It was chosen to tie in with the NZCA 1991 survey headings, but was intended to express an hard-to-define ‘X factor’ quality about whitewater (something between density of features, quality of water, shape and power of hydraulic features and the effect they have on a kayaker versus the kayaker’s expectations). The ‘top’ score of 5 being titled “only on my best form” implies a bias towards harder whitewater that this category was not supposed to represent.
- River sections often have names that are not known by the general public, especially visitors to the region or the less experienced. Some I only found out as I conducted The Survey. This may have led to some people completing information about the wrong section of river, for example Arahura Newton Creek versus Arahura Styx Saddle. The results for each section do, however, more or less match my expectations suggesting this is not a major factor.
- Having so many river sections (rows) in the question made analysis a nightmare, with the online survey package crashing or churning impractically slowly when analysing this question. For future use, I would break this question down into subsections.

Question 3A, asking participants to plan an itinerary, was the worst question in The Survey on all levels and produced little or no useful data. It was intended to show links between
rivers, as I know that visitors in particular often have a ‘tick list’ with a fairly set order related to difficulty and other factors. However, this question was misunderstood by participants and could not account for factors such as weather, leading to emailed complaints from participants and poor data. I have not reported on this question in my findings.

Question 3B, an open question asking participants to describe what the West Coast rivers mean to them, was highly effective in gaining rich qualitative data. It received 101 complete answers of varying lengths. There were no queries regarding this question.

Questions 4-10, requesting demographic information, worked well in providing data about what the respondents’ profile was (for example most had been kayaking over 10 years). I received one complaint that the ethnicity question did not allow for just “New Zealander”.

### 3.4.3 Issues with the online environment:
- The use of cookies to prevent “ballot box stuffing”: The Survey recognised a computer so that participants could leave and come back to The Survey. This prevented multiple users using the same computer and, after contact from a frustrated couple, this action was lifted (thereby enabling ‘ballot box stuffing’ if someone wished to do so). Given that The Survey took most users 30-70 minutes to complete, I think it is unlikely that anyone chose to repeat The Survey deliberately to skew results.
- Participants wishing to have a survey deleted could email me their user number, with the idea being I would then search the user number record and delete their entry. This was requested once and I found that the user number generated did not appear to match the ones in the register and there was no way to search the register, so the participant’s survey was not withdrawn (and the person was informed).
- It was suggested that a question be added in future saying “are you ready to submit”, prompting participants to go back and check their answers before submitting.

### 3.4.4 A potentially more significant problem could have been biased promotion of The Survey leading to participants’ completion with agendas (for example rate everything highly to promote conservation). This could happen through social networking as others put their own spin on why to complete The Survey. To reduce this effect, I made access to The Survey exclusively through my blog with carefully worded neutral text.
walking in to rivers is a valued part of the recreation; Kevin England on his way to the Crooked. There are many rivers on the West Coast where walking in is not an option due to distance and terrain, particularly given the potentially arduous and dangerous kayaking required to get out.
4 Summary of key findings

I have produced a variety of products from this work, which are either attached as Appendices or available online; I also have a set of unprocessed data, available for analysis, from The Survey which is shared by Lincoln University and the Department of Conservation, Hokitika. Not all of this work can be described as “key findings” as it is aimed at providing reference data for decision makers and planners. In this section, I will describe what I see as stand-out points of learning, by project objectives.

![Picture 12: classic West Coast gorge with blue water, steep scoured gorge walls and overhanging bush; the Arahura’s Second Gorge.](image)


4.1 Project objective 1  
*Develop a system for effective assessment of recreational value (specifically for rivers from a whitewater recreational user perspective but with a view to use for other activities)*

I have already discussed what I see as the merits of the methods used. To me, there are three key points from my use of the method:

1. Kayaking the rivers, with others in a recreational setting, has been an invaluable tool in assessing their recreational value. No amount of paper/electronic data can replace having been there and experienced it. This would equally apply to any other activity, for example fishing. Prior experience in river value assessment is important in providing a framework for observation; this method is also expensive and time-consuming, but I would regard it as the ultimate method for assessing values in detail.

2. The Survey provided data from users around the world which is reasonably deep in qualitative and quantitative detail. It was cheap and time-efficient, even offering its own basic statistical reports. It would be very easy to adapt this technology for any number of applications, although for some river uses (such as swimming) it may be harder to access participants online.

3. One thing that has been asked for and I have not provided is a method for assessing and describing overall “recreational value for kayaking”. This is because I cannot find a benchmark to assess against, or consistent agreement on what elements make up value, and through thinking and discussing this issue all year I have concluded that no score can be an accurate representation of overall value: each user’s needs and wishes are different so their assessment of value will be different, meaning an overall value is a product of averages and hides important depth.

For my purpose, I have taken “recreational value to whitewater kayakers” to mean a combination of

- Overall importance as described by users
- Whitewater qualities as described by users and me as a researcher
- Landscape scenery qualities as described by users and me as a researcher
- Wilderness qualities as described by users and me as a researcher

Additional primary indicators of “recreational value to whitewater kayakers” that I consider valid for specific rivers are:

- **Numbers of users** and the **number of trips** each person makes to a river, the higher number indicating greater value, although this does not have a linear relationship with overall value as some prized rivers have very limited numbers of users and return visits due to being extremely difficult and/or hard to access and/or expensive. It should also be pointed out that low numbers of users does not mean that a river is unimportant to all users, and commonly a river is highly valued by a few people who live close to it, particularly if it is rain dependant for example. A river with a high number of trips per person may be scored lower for other values but be very important as the most accessible trip; again this is not a linear relationship as access factors (for example the cost of helicopter use) affect repeat visits
• The ‘visitor catchment’ of a river, where a river’s users come from, the further away indicating greater value. Classifications help here (local, neighbouring regions, other South Island, North Island, overseas) as there is no point counting visitors from the UK as indicating greater value than from Japan, for example. As above, although this indicator is generally reliable, it hides the very high value placed on some rivers by local users and has minor complications in that visitors from further away are more constrained by time so tend to kayak a smaller range of rivers: these will be based on reputation which is a good indicator of value, but may exclude some highly valued rivers because they were too low when the visitor was present or the visitor simply didn’t have time. Kayakers who are at the early and intermediate stages of learning do not tend to travel far for river experiences, which greatly reduces this indicator’s validity for low grade rivers (for example the Arnold). Graph 1 is a sample of how this data is shown in The Survey and river trip reports (Appendix 3).

To assess the value of a region, I think it is important to also consider:

• the density of high quality rivers (as defined in the individual river assessments). A higher density makes a region more attractive as it offers more choice and more variety which, given the nature of hydrology combined with users’ demands, will inevitably result in more activity

• the connectedness of rivers in the region; the way in which users may wish to progress between the rivers in the region to meet their demands. This concept includes a view of the spread of rivers by their difficulty as this is the primary factor that dictates which rivers users can access (a harder river with higher grade will be too dangerous for some users; an easier river with lower grade may not offer sufficient interest to some users).

Graph 1: each river trip report shows where its respondents came from (in The Survey). The pie chart shows countries (NZ in dark grey); the column shows NZ regions (here, West Coast and Canterbury are largest). Only countries and NZ regions with respondents in the graph are listed in the key, despite other colours being present in the key – this was an Excel graphing function I could not resolve.
4.2 Project objective 2
Assess and record the value of major drainages in the West Coast region to whitewater recreational users

I have a volume of data relating to this objective that I would not count individually as ‘key findings’. I will report on this objective in the following order:

4.2.1 How survey respondents value whitewater river environments
4.2.2 How survey respondents rated the rivers
4.2.3 How survey respondents rated the West Coast region’s rivers as a whole
4.2.4 Other key points from my observations this year
4.2.5 My overall assessment of value of the West Coast’s rivers to whitewater recreational users

Picture 13: a rare calm gorge in the upper Hokitika
4.2.1 How survey respondents value whitewater environments

Mean Likert scores for Question 1 (see Graph 2) clearly show Whitewater as the favoured attribute, with Scenery and Wilderness shortly after. It is notable that no attribute is unimportant, although Access and Flow Reliability scoring in the three range indicates they are commonly regarded as “neither important nor unimportant”. Greater depth of information about scoring is offered by Graph 3.

The percentage columns show that most people scored most attributes 4, i.e. very important. It is reasonable to take from this that these attributes are all important for whitewater kayakers, but it may also show a rating trend. What is more revealing is the variation in allocations of the score 5, which to me suggests that respondents were in fact thinking about their responses with some care rather than simply claiming everything is very important.

It is likely that access was rated as it was (neither important nor unimportant) as it is seldom a problem on the West Coast, yet access is critical so very few people scored it as unimportant.
Flow reliability is a difficult attribute as many rivers are only good when in flood: this makes them less likely to be kayaked by people who live further away, but highly valued locally. Due to this dilemma, scoring of this attribute is of questionable validity.

Similarly, scarcity of a river is not an easily defined concept and, in terms or a region’s attractiveness to kayakers, the opposite may be positive i.e. a plethora of similar high quality rivers. The higher incidence of 5 scores for this attribute most likely reflects the experienced/specialised nature of survey respondents, self selected people who have kayaked whitewater on the West Coast, have a distinct demographic profile that may also help to explain such scoring. Most respondents (55%) have been kayaking for over 10 years and 51% prefer grade 4 and harder, with 81% being male.

Scenery, whitewater and wilderness are all well-defined concepts and their scores are not surprising. Over 90% of respondents scoring whitewater 4 or 5, an average of 4.5/5, shows that whitewater kayakers clearly prioritise the hydrodynamic qualities of a river the most, but like to do that activity in naturally attractive environments if possible. Wilderness, though, has mixed blessings for a dangerous activity and I suspect that motivations for scoring it are more diverse than for scenery and whitewater: from observations over the year, some people do not like wilderness conditions, favouring safety from ease of egress; others see wilderness as a hindrance to accessing whitewater; others like wilderness for the additional challenge of conducting a dangerous activity with added risk; others like wilderness for the appreciation of nature.

In the “Other” category (see Appendix 2) water quality/cleanliness stood out as important with 38 entries. There are many references to social factors such as comradeship. There are also several entries that repeat the given headings such as wilderness or scenery.

Picture 14: steep and clean grade 4+ whitewater on the Perth River; Eddie Murphy.
4.2.2 How survey respondents rated the rivers

I have not given an overall rank, but rivers are graphed by order of their scores under the headings

- Overall importance
- Number of users
- Percentage of users from overseas
- Whitewater challenge
- Scenery
- Wilderness

This data is presented in Appendix 2.

![Image](image.jpg)

Picture 15: Mick Hopkinson surfs Lyell Wave on the Buller River Earthquake section.

Each river is reported on in River Report Forms in Appendix 1.

No single river stood out as being the most important or highly valued. There is remarkable reshuffling of river ranking between values scored in The Survey (see Appendix 2).

When the maps are analysed (see Map 2 and Appendix 2) there are two main points to be taken:

1. The West Coast region has a remarkably high density of highly valued whitewater rivers
2. Northern Westland, from the Taipo south to the Whataroa, has the highest density of whitewater rivers and most of the popular sections (except Buller Earthquake, but this is mostly considered part of Murchison). These rivers are generally day trips and highly valued across most aspects, although critically it is in part their high density that makes them so highly valued (see open ended questions in Appendix 2). Northern Buller and South Westland have a few very highly valued rivers and these are generally longer, more wilderness-focussed trips.
Map 2: river regions of the West Coast as defined by whitewater kayaking character; this map is included as a fold out in the envelope at rear.
4.2.3 How survey respondents rated the West Coast region’s rivers as a whole

The open ended question “describe what West Coast rivers mean to you” produced some every rich data, with 101 written responses. A graphic illustration, with the top 50 words approximately proportional to their occurrence frequency, is reproduced from Wordle (Graph 4) below:

[Graph image]

Graph 4: Wordle image with approximately proportional representation of words as they appeared in the responses to the open ended question “what do West Coast rivers mean to you?”

A selection of the most insightful quotes is below:

“I’ve travelled with a kayak to over 30 countries, participated in several major kayaking exploratory international expeditions, and I remain absolutely convinced that the West Coast has the most unique and most beautiful wilderness kayaking experience to be found anywhere. Stellar access with helicopter drop-ins, hard walk-in access, and remote and unspoilt pristine wilderness settings with true adventure challenge makes the Coast a destination for any elite kayaker, and is the reason I moved to New Zealand!”

“The West Coast is the heart of whitewater in NZ and I just love the place.”

“The rivers of the West Coast of New Zealand are quite simply unique from a global perspective. There is nowhere on the planet that offers such accessible wilderness trips of such a high quality of whitewater in unique ecosystems, often on crystalline water, almost always with the highest level of technical river running.”

“They are an incredible natural creation with stunning beauty and enormous adventure potential. There are a couple of these rivers that would have a similar national significance to me as say, Mt Cook or Mt Aspiring!”
4.2.4 Other key points from my observations this year

Other key points from my observations this year (noting that this report is primarily for use by DoC and so these observations largely relate to logistical factors that I have noted through working within DoC):

- **Helicopters** are necessary to access most rivers and are viewed positively by kayakers. Within DoC, helicopter access appears to be regarded as invasive and having a negative impact. Yet kayakers reported positively about helicopter use in The Survey and that was backed up by my observations in the field. I also noted that helicopters’ impacts are temporary, very brief in fact, and no traces are left. More intrusion was noted from the orange markers, bridges and ladders of tramping tracks beside rivers than from helicopters. I would like to see more research about the use of helicopters in the backcountry.

- **Wilderness zoning** prevents helicopter access to some very high quality rivers which effectively prevents kayak access. I accessed the Cascade and Waipara rivers using research permits from DoC and found them to be amazingly high quality whitewater wilderness trips: that is to say that the whitewater qualities might not be as high as other rivers but the overall journey experience was top class. This results in reduced recreational opportunity with at least two top class experiences denied to kayakers. Maps of wilderness zones do not appear to have taken into account river users and I would like to see a review of wilderness zoning with all users represented.

- **A systematic communication system with kayakers is needed.** DoC’s website has very little information on whitewater kayaking and DoC staff I discussed this with agree that very little is known about whitewater kayaking. The Survey indicates that lots of whitewater kayaking does happen on the DoC estate and should help DoC staff understand this form of recreation better. However, rivers and recreational activities change constantly and this work will be outdated soon: a systematic form of communication with whitewater recreationalists is needed, in my opinion, to continue to meet their needs. Whitewater New Zealand is the official body representing whitewater kayakers and their contact details are in the References section.

![Picture 16: early morning on the Cascade, a highly valued environment-focused kayaking experience with access normally prevented by Wilderness zoning. Kayakers travel without trace.](Image)
4.2.5 My overall assessment of value of the West Coast’s rivers to whitewater recreational users

Given what I have already stated, my overall assessment is qualitative with a recognised, albeit minimised, element of subjectivity, informed by a year of research.

As a collection, the rivers of the West Coast region are the most highly valued in New Zealand and amongst the most highly valued in the world by whitewater kayakers: this is most clearly evidenced by the open ended statements in The Survey but can only be further evidenced by national and international surveys. To whitewater kayakers around the world, the West Coast region is characterised by its rivers and its rivers are characterised by their high levels of challenge, scenery and wilderness.

In comparison to other regions of NZ and the world, the West Coast region has a very high density of rivers that have been assessed by me and by survey respondents as offering great whitewater challenge, inspiring river scenery and a strong wilderness feel. Added to this are such qualities as cleanliness and clarity of water, a range of access arrangements including helicopter access, physical closeness of rivers meaning low travel times between rivers, and a wider regional experience that offers additional social attractions.

That so many rivers of the West Coast are valued so highly does not belittle their assessment, but truly represents their remarkable qualities. It makes it impossible to segregate a common set of top rivers, but a general trend is that northern Westland has the highest concentration of top rated rivers for whitewater challenge, with very high scores for scenery and wilderness; while northern Buller and South Westland have small concentrations of rivers top rated for wilderness and scenery with high ratings for whitewater challenge.

Although the main whitewater kayak users of West Coast rivers are highly specialised and experienced, which reflects and is reflected by the high proportion of more challenging rivers, the region is held in high regard as a destination to aspire to by users of lower ability.

Picture 17: whitewater kayaking is made enjoyable by intuitively blending technical skills and knowledge of river dynamics with an element of risk that satisfies the need for personal challenge, preferably in a naturally beautiful setting; Jason Arbetter on the Arahura.
4.3  **Project objective 3**  
*Develop a method for data presentation that enables use for a variety of applications for example outcome statements for management plans, indicative tools for hydro scheme developers*

Making data available and useful is challenging, especially when the potential users are unknown. For this study, DoC will host the complete data set at the West Coast Conservancy office and have it available through personal contact with Ian Wightwick, Technical Support Supervisor, Visitor and Historic Management. Ken Hughey at Lincoln University will host raw data from The Survey. I will host all data and maintain my blog [www.westcoastnzriverstudy.blogspot.com](http://www.westcoastnzriverstudy.blogspot.com) as a portal for people trying to find data on West Coast rivers.

The most readily accessible form of data presentation should be a Google Earth file that summarises data from The Survey. However, technical issues with software on the DoC network prevented a final form being produced. I was sufficiently excited about the method’s potential that I have included the Google Earth file in the DVD of electronic resources. The file simply needs to be opened whilst using Google Earth and it should be viewable automatically and offer the option of saving to ‘My Places’. Where further questions arise, more direct contact will be required as above.

![Google Earth screenshot](image)

**Picture 18**: screenshot showing sample image from Google Earth download, providing located summary information from The Survey. Red lines show locations of rivers included in the survey; when your mouse cursor hovers over a line, survey data appears as a pop-up next to the river.
5  Scope for further work

5.1  In terms of defining the value of the West Coast region, it would be very useful if a national survey could be completed (even better if done internationally). This would be particularly useful if sufficiently similar questions were used to allow direct comparison and, ideally, the synchronisation of data from The Survey. This would help to calibrate value ratings and offer confirmation or challenge assertions about the overall value of the West Coast region.

5.2  If it is accepted that density of high quality rivers and connectedness of rivers are valid indicators of a region’s significance, then further research into these factors would be useful.

5.3  I am not fully happy with the depth of detail about what attributes of rivers in general mean to whitewater kayakers. The open ended section in question 1 of The Survey did not gain further insight as few suggestions were made by respondents. Further study on the relationship between kayaker specialisation and the river qualities they seek, enabling a user-focussed profile, would be useful evidence for anyone deciding issues around environmental management of rivers. A data contribution to this study could be taken from the raw data from The Survey, by separating the answers of respondents by specialisation indicators, such as their preferred grade or length of kayaking experience.

5.4  As mentioned in 2.5, I had planned but did not conduct interviews. I think this would offer qualitative insights into the value of West Coast rivers as well as an important historical record.

5.5  The rivers of the West Coast change naturally with floods, landslides and earthquakes regularly. This may affect their recreational value (for example the Kokatahi is more accessible and popular since “Carnage Gorge” silted up, becoming safer). A regular reassessment or update system for this database would be very useful.

5.6  No method so far has allowed for absolute numbers of users to be established. We discussed automated counters, logbooks and using observers, but rejected all methods in favour of The Survey indicators due to feasibility.

5.7  Any assessment of overall recreational value, or analysis of a region/nation’s river values, must obviously include all river users. The RiVAS method is attractive because it does include a range of users. However, in the ideal world an in-depth study of a range of river users would be created.

5.8  This study has only looked at the value of the West Coast’s rivers to whitewater kayakers. It would be useful to look at the value of whitewater kayakers to the West Coast, although some conclusions may be drawn from the final (demographic) section of The Survey.
5.9 It would be very useful for DoC to research the actual impact of helicopters in remote areas and the impact of different user groups.

Picture 19: Morgan Gorge on the Waitaha River; grand, pristine, spectacular, awesome, daunting, tempting, terrifying, inspiring and first fully kayaked in 2010.
6 Acknowledgements

My hosts, Ian Wightwick of DoC and Ken Hughey of Lincoln University, were instrumental in developing this project and very understanding; Liam Anderson at DoC created all my maps and it was great to work with Trevor Johnston. The staff at the RSNZ\(^5\) have been a tremendous support and the scheme itself is amazing: as a teacher, I feel rejuvenated, upskilled and satisfied to have applied my Geography academic background. Shayne Galloway of the University of Otago freely offered great support, as did Kay Booth of Lindis Consulting, whilst Doug Rankin from Whitewater New Zealand shared his depth of experience. Mary Trayes at the West Coast Regional Council was positive and helpful.

Sony New Zealand supplied me with a laptop, camera, GPS and voice recorder. Pyranha Mouldings provided my kayak and Palm Equipment provided my outer wear, with Hydroscapes Safety Gear providing my lifejacket.

To get down the rivers safely I relied on good teams, and all of these people waited patiently for me while I conducted my work; Eddie Murphy and my brother Kevin particularly.

The project is dedicated to Sam Rainey, who would have had something to say about it.

\(^{5}\) The New Zealand Sciences Mathematics and Technology Teacher Fellowship Scheme is funded by the New Zealand Government and administered by the Royal Society of New Zealand.
Notes
7 References and sources of further information


Te Runanga o Ngai Tahu (2002). Freshwater Policy.


Contacts for further information

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