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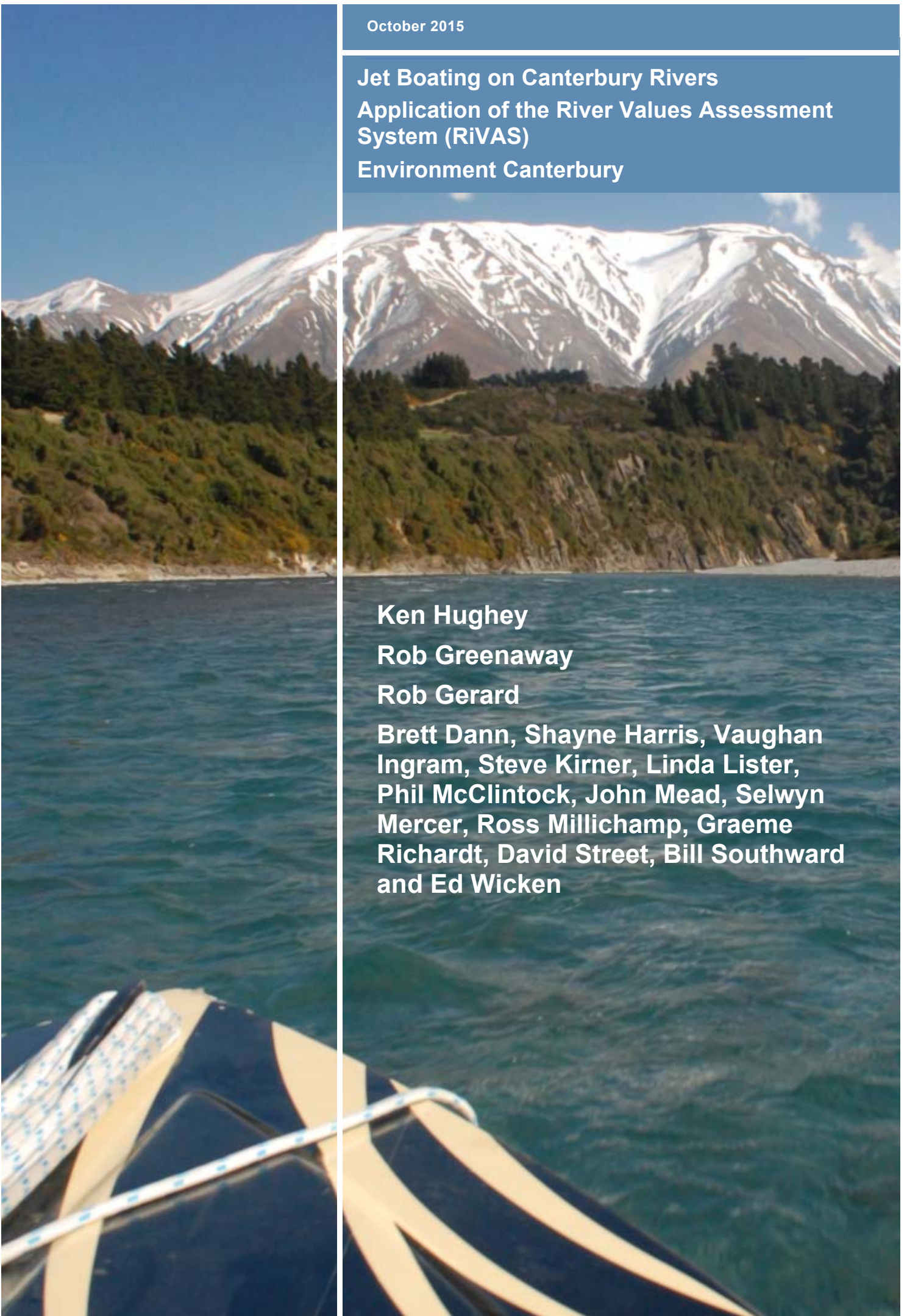
**Jet Boating on Canterbury Rivers
Application of the River Values Assessment
System (RiVAS)
Environment Canterbury**

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Prepared for Environment Canterbury

by

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1. INTRODUCTION

1.1 PURPOSE

This report presents an application of the River Values Assessment System for existing value (RiVAS) to jet boating in the Canterbury region, undertaken in April-May 2015. The project involved an initial review of literature and then two workshops to identify primary attributes and indicators, and to populate the data set for final evaluation and determination of ranked rivers for importance to jet boating in Canterbury. This report needs to be read in conjunction with the RiVAS method (see Hughey et al. 2010).

A second and stand-alone report has been developed by Greenaway, Hughey and Gerard (2015) to provide a complete overview of jet boating in Canterbury and qualitative and interpretive data based on, and in addition to, that presented in this report. That report and this RiVAS assessment have been structured to allow for easy review and update over time.

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

The process for developing the RiVAS application for jet boating differed from other RiVAS applications (except for Higgs et al. 2012). An iterative online process following a literature review to identify ideas for discussion helped establish a set of proposed attributes, which were fully developed at the first Expert Panel meeting held on 18th April 2015 at Lincoln University. Because of the nature of jet boating in New Zealand (most of the national level expertise is also Canterbury level expertise), this approach was deemed appropriate. The regional Expert Panel (which can also be taken as providing national-level expertise) convened for developing the jet boating RiVAS application in the Canterbury Region comprised 14 members, advised by Ken Hughey (Lincoln University) and Rob Greenaway. Rob Gerard of Jet Boating New Zealand (JBNZ) assisted in reviewing the panel's findings (as well as being a panel member) and helping confirming the final report. Credentials of the Expert Panel and other team members are provided in Appendix 1.

2. APPLICATION OF THE METHOD

There are two parts of the system: RiVAS is applied to existing value in steps 1-9 and RiVAS+ to potential value in steps 10-14.

STEP 1: DEFINE RIVER VALUE CATEGORIES AND RIVER SEGMENTS

RIVER VALUE CONTEXT FOR JET BOATING IN CANTERBURY REGION

The Canterbury Region, stretching from the Clarence in the north to the Waitaki in the south, is the historic and contemporary 'home' to most of New Zealand's jet boating. The first jet boats were developed by the late CWF Hamilton on the Waitaki River in the 1960s to overcome the problem that outboard motor boats had on the shallow braided rivers of Canterbury. Jet boats are now widely used in New Zealand and internationally, but in New Zealand favoured rivers are still those mainly occurring in Canterbury; the Waimakariri, Rakaia, Rangitata and Waitaki all to the fore.

Jet boating is subject to a regulatory environment which controls when and if sections of rivers are allowed to be boated. Jet Boating NZ holds a list of these rivers and sections of rivers and this list was used extensively in this application.

RIVER VALUE CATEGORIES

All rivers for this value have been treated primarily in the same way, except where distinctive indicators for the prime attributes (see steps 3 and 4 below) can be identified and used appropriately.

RIVER SEGMENTS

Work in advance of the expert panel meeting to collate existing data, indicated that empirical and expert knowledge primarily held by Canterbury Regional Council and Jet Boating NZ, and by jet boaters themselves, would be the primary data sources. There is little to no published quantitative data about jet boating in Canterbury or New Zealand generally; thus a reliance on experts is appropriate.

For the purposes of this analysis we generally needed to break individual catchments into upper, gorge and lower reaches, because of their different characteristics and sometimes because of the varying regulatory regimes in operation.

Following a preliminary scanning exercise, many rivers within the Canterbury Region were excluded from further assessment. Criteria considered as part of this preliminary scanning were the river or stream has:

- no known or suspected use for jet boating, e.g., Harts Creek, Avon River;
- no real potential to be used in the future.

There is a large number of rivers in this list and it is therefore easier to examine those that were evaluated (i.e., the list in Appendix 4; a separate list of rivers considered to have potential, but currently restricted by regulation, is provided in Appendix 5).

OTHER CONSIDERATIONS

There is no known specific Tāngata Whenua interest in jet boating.

OUTCOMES

Use part catchments as the primary data set and populate with existing data and/or expert panel input.

STEP 2: IDENTIFY ATTRIBUTES

An earlier literature review was used as the basis for identifying a set of attributes for then running the iterative online process with the expert panel to proposed a set of primary attributes. Appendix 2 presents the full list of attributes considered.

STEP 3: SELECT AND DESCRIBE PRIMARY ATTRIBUTES

Nine primary attributes were ultimately identified (and which are highlighted in bold in Appendix 2) by the Expert Panel. There was considerable discussion about the rationale for each of these and this is summarised in Appendix 2.

STEP 4: IDENTIFY INDICATORS

Indicators for each primary attribute were identified by the Expert Panel and are shown also in Appendix 2, and in Appendix 3 evaluated against SMARTA criteria.

STEP 5: DETERMINE INDICATOR THRESHOLDS

Thresholds are applied to an indicator to determine high, medium and low relative importance for that indicator. Thresholds were defined by the Expert Panel (e.g. <500 jet boater days per annum = relatively low importance).

STEP 6: APPLY INDICATORS AND INDICATOR THRESHOLDS

Most indicators were assessed using expert panel based quantitative data, or interpretation of quantitative data by the Expert Panel (see Appendix 2) - this step involved entering data from the relevant data sources (primarily the experts). Two expert panel assessment workshops were held:

- Lincoln University 18th April 2015 (photo below)
- ECan, Timaru 16th May 2015

Both workshops were facilitated by Ken Hughey. Rob Gerard representing JBNZ was also present at both and at a final meeting in Christchurch held on 12th June 2015 where he, Ken Hughey and Rob Greenaway did a final data check.

Note that in Appendix 4 expert panel scores are in red; this is because they are entirely subjective albeit informed by vast experience and perception. Other data are presented in black type face, including numbers of commercial jet boat patrons provided separately by operators on the Rakaia, Waiau and Waimakariri Rivers.

There were some differences in opinion on the levels of casual activity on the Rakaia and Waiau Rivers expressed by commercial operators and the Expert Panel. The assessments of the Expert Panel are relied on in this report, for consistency with other river assessment reasons) and this matter is further discussed in Greenaway, Hughey & Gerard (2015).



STEP 7: WEIGHTING OF PRIMARY ATTRIBUTES

The initial evaluation was undertaken using equal (1x) weightings for all indicators. Subsequently it was considered river flow was more important than any other indicator, and that regulatory considerations, while important, could be managed directly and were thus not as important as the other primary attributes. As a consequence, these two indicators were weighted as:

- Flow reliability – x2 weighting
- Regulatory considerations – x0.5 weighting.

Otherwise all other indicators were unweighted.

STEP 8: DETERMINE RIVER SIGNIFICANCE

STEP 8A: RANK RIVERS

The spreadsheet in Appendix 4 was used to sum the indicator threshold scores for each river. The sums of the indicator threshold scores were placed in a column and then sorted in descending order. This provided the list of rivers ranked by their significance scores.

STEP 8B: IDENTIFY RIVER SIGNIFICANCE

Using the ranked list from Step 8a, the Expert Panel closely examined the rivers, and their attribute scores. The following criteria were applied to defining importance within the Appendix 4 evaluation:

High or National significance:

Criterion 1: If any river section had ≥ 2000 user days per annum; or

Criterion 2: *Flow reliability* during the October-March peak jet boating season was $>80\%$; or

Criterion 3: Total score is 21.5 or more;

then national significance.

Medium or Regional significance:

Rivers sitting between *Local* and *High or National significance*.

Local significance:

A total score of <14.5 and *Level of use* is ≤ 500 jet boaters per annum.

OUTCOME

A list of rivers ranked by a scoring system from highest to lowest, represents an initial significance ranking list. See Appendix 4.

Rivers are identified as significant at the national, regional and local level.

Rivers in the Canterbury Region not listed have either very low value to jet boating or are of unknown value, or have potential but are subject to regulation restrictions (Appendix 5).

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

If any notable issues are raised in the workshop or by others, which cannot be accommodated in the indicators, then they will be recorded separately.

OUTCOME

Other relevant issues will be recorded and are noted in Appendix 3. As stated, a second and stand-alone report has been developed by Greenaway, Hughey and Gerard (2015) to provide additional and more quantitative review.

ACKNOWLEDGEMENTS

Canterbury Regional Council funded and supported this work and we thank them for that support. We also appreciate the generous time input made by those who attended the two expert panel meetings and who contributed in other ways to this report.

Paul Vernel of Jet Thrills, Christian Chester of Thrillseekers Adventures and Blair Grice of Discovery Jet kindly provided estimates of commercial activity on the Waiau, Waimakariri and Rakaia Rivers.

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<http://ageconsearch.umn.edu/bitstream/115406/2/Hughey%20Paper.pdf>.

APPENDIX 1: CREDENTIALS OF THE EXPERT PANEL MEMBERS AND PEER REVIEWERS

The Expert Panel comprised 14 members:

- Brett Dann, Vice Chairman Waitaki Branch JBNZ
- Rob Gerard (see below)
- Shayne Harris, Committee member Canterbury Branch JBNZ
- Vaughan Ingram, Committee member Canterbury Branch Jet Boating New Zealand
- Steve Kirner, Chairman Secretary/Treasurer Canterbury Branch JBNZ
- Linda Lister, Secretary/Treasurer Canterbury Branch JBNZ
- Phil McClintock, Committee member Canterbury Branch JBNZ
- John Mead, Committee member Waitaki Branch JBNZ
- Selwyn Mercer, hunting and fishing guide (jet boat specialist), Wild Safaris
- Ross Millichamp, author (Salmon Fever), Conservation Services Manager at Department of Conservation, ex Fish and Game Regional Manager North Canterbury
- Graeme Richardt, Committee member Waitaki Branch JBNZ
- David Street, JBNZ President and Trustee of JBNZ Heritage
- Bill Southward, Little Rakaia Huts resident, NZCS Coastal Champion Award recipient 2013
- Ed Wicken, Committee member Canterbury Branch JBNZ

The panel was assisted by:

Ken Hughey who is Professor of Environmental Management at Lincoln University (and Chief Science Advisor for the Department of Conservation). His expert knowledge of freshwater related issues spans the period 1981-2015, including his PhD thesis (habitat needs of birds of braided rivers), multiple ecological projects in almost all regions of the South Island, expert evidence at multiple hearings and published research papers. Ken is overall project manager of the ongoing river values (RiVAS) project.

Rob Greenaway is a consultation recreation and tourism planner and researcher. Since the late 1990s Rob has completed approximately 60 river-based recreation research projects and assessments of effect for hydro and irrigation proposals throughout New Zealand, including all of the major Canterbury rivers.

Rob Gerard has been a committee member of the Canterbury Branch of Jet Boating New Zealand since the 1980s, and served on the National Executive of Jet Boating New Zealand at various times between 1985 and 2015, particularly the Rivers subcommittee which is involved in maintaining river access. He co-owned Cee Bee Marine (1984) Ltd, a specialist jet boat business from 1984-87 and was owner/operator of two jet boat tourist businesses; Goldfields Jet in Cromwell and Jet Boat Charters in Wanaka. He remains an active jet boater.

APPENDIX 2: ATTRIBUTES, INDICATORS AND THRESHOLDS – JET BOATING

ATTRIBUTE CLUSTERS	ATTRIBUTE (primary attributes in bold)	DESCRIPTION OF PRIMARY ATTRIBUTES	INDICATORS	INDICATOR THRESHOLDS	DATA SOURCES (and reliability)
<p>Step 2: Identify attributes Step 3: <u>Select</u> and describe primary attributes</p>		<p>Step 3: Select and <u>describe</u> primary attributes</p>	<p>Step 4: Identify indicators</p>	<p>Step 5: Determine significance thresholds</p>	
<p>Users</p>	<p>Number of users</p>	<p>High use implies high value. However, this assumption will under-value special and remote places for several reasons, including:</p>	<p>Number of jet boater days per annum</p>	<p>High: >2000 jet boater days per annum (score: 3); Medium: 500-2000 jet boater days per annum (score: 2); Low: <500 jet boater days per annum (score: 1)</p>	<p>Expert Panel estimate (fair)</p>
	<p>Level of commercial use</p>	<p>This may imply higher value (positive relationship with level of commercial use).</p>	<p>Number of commercial jet boat passenger days per annum</p>	<p>Included in the above indicator</p>	<p>Data from Commercial jet boat operators and recorded as a subset of PA 1 above</p>
	<p>User catchment</p>	<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>Jet boater's home district/region – combinations of: 3= (International), National, Regional and Local; 2 = Regional and Local; 1=Local</p>	<p>High: Combination of (International), National, Regional and Local (score: 3); Medium: Combination of Regional and Local (score: 2); Low: Within district (score: 1)</p>	<p>Expert Panel estimate (fair)</p>

	Desire to return	The Panel considered this could be developed as a useful overall indicator of how jet boaters 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 jet boating grading (note that the panel decided not to use the grades as they were considered a poor measure of quality of experience or skill).			
	Type of use	<p>Jet boating is undertaken for a wide variety of reasons. It is important to record the range of uses for particular sections. A threshold of around 2.5% of use was considered a trigger for inclusion in the list.</p> <p>The major river use is identified in bold for each section.</p>	<p>Range of uses: Commercial (C), Hunting (H), Trout fishing (TF), White baiting (WB), Racing (R), Family (F), Salmon fishing (SF), Adventure boating (AB), Duck hunting (DH), Tramping (T), Access (A), Search and rescue (S&R), Training (Tr), Industry (I)</p>	<p>High = 3= >6 uses; Medium = 2= 3-5 uses; Low = 1=<3 uses</p>	Expert panel assessment.
	Organised Events	<p>Number of sanctioned national level and regional level events per annum – calculate based on the last 5 years of record</p>	<p>Number of type of events</p> <p>3 = International, National, Regional, Local and family;</p> <p>2 = Regional, local and family;</p> <p>1 = local and family;</p> <p>0= no events</p>	<p>High = 3 = International, National, Regional, Local and family;</p> <p>Medium = 2 = Regional, local and family;</p> <p>Low = 1 = local and family; 0= no events</p>	<p>JBNZ calendar of events and EP knowledge (good)</p>

Environmental setting	Density of high quality hydraulic features	<p>Number, variety and quality of hydraulic features (e.g. braids, waves, rapids, drops).</p> <p>Density of high quality hydraulic features should be considered in the context of the type of jet boating opportunity offered (e.g. the grade of jet boaters attracted).</p> <p>Density is averaged over an entire reach.</p>	<p>Jet boaters' perception. Interim metric is Expert Panel estimate (5-point rating scale):</p> <p>1=Very few features to</p> <p>5=Very many features</p>	<p>High: High density (score: 3); Medium: Medium density (score: 2); Low: Low density (score: 1)</p>	<p>Expert Panel estimate (good)</p>
	Flow reliability	<p>Generally correlates positively with jet boating value, but there are exceptions.</p> <p>Reliability will influence user catchment as locals will more able to take advantage of unpredictable flow events.</p> <p>Hydro-controlled rivers create assessment difficulties as some offer a low % of time jet boatable, but very reliable timing.</p> <p>Measured for the peak jet boating season of Oct-Mar inclusive</p>	<p>% of time river is jet boatable.</p> <p>Expert Panel estimate: bands of 10%</p>	<p>High: >66% (score: 3); Medium: 33-66% (score: 2); Low: <33% (score: 1)</p>	<p>Expert Panel estimate (fair)</p> <p>Regional council modelling data (good for some rivers)</p>
	Quality of on-water Experience	<p>Based on having around 2 years of river jet boating experience, i.e., beyond novice, jet boaters on average will rate challenge more highly than other experiences</p>	<p>3 = rare, challenging, remote, bucket list, one of a kind;</p> <p>2 = something a bit special;</p> <p>1= everyday boating river</p>	<p>High = 3 = rare, challenging, remote, bucket list, one of a kind;</p> <p>Medium = 2 = something a bit special;</p> <p>Low = 1= everyday boating river</p>	<p>Expert panel</p>
	Presence of iconic river features	<p>The Panel felt the primary focus could be the presence of in-water features that make a fundamental contribution to jet boater experience.</p>			
	Water quality	<p>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.</p>			

	<p>Scenic attractiveness</p>	<p>A common attribute in (the few) river user surveys. Generally, it is expected that there is a positive relationship between perceived scenic attractiveness and jet boating amenity.</p>	<p>Jet boater’s perception of scenic attractiveness (5-point scale). 1=Uninspiring to 5 = Inspiring</p>	<p>High: Inspiring (4 or 5) (score: 3); Medium: Attractive (3) (score: 2); Low: Uninspiring (2 or 1) (score: 1)</p>	<p>Expert Panel estimate (good)</p>
	<p>Wilderness character</p>	<p>This setting attribute has a positive relationship with jet boating amenity – the higher the perceived wilderness character, the higher the jet boating value.</p>	<p>Jet boater’s perception of wilderness character. Expert Panel estimate (5-point rating scale): 1=No wilderness value to 5=Exceptional wilderness value</p>	<p>High: very high wilderness value (score: 3) Medium: moderate wilderness value (score: 2) Low: low wilderness value (score: 1)</p>	<p>Expert Panel estimate (good)</p>
<p>Social setting</p>	<p>Encounters with other river users</p>	<p>May influence (positively or negatively) the jet boating experience</p>			
<p>Regulatory considerations</p>	<p>Legality of jet boating</p>	<p>Influences which rivers or sections of rivers are able to be jet boating including seasonal considerations. Record primarily for the main jet boating months of Oct-Mar inclusive</p>	<p>3 = no restrictions; 2 = less than 4 months of seasonal limits; 1 = greater than 4 months and less than absolutely no); 0 = no boating allowed</p>	<p>High = 3 = no restrictions; Medium = 2 = less than 4 months of seasonal limits; Low = 1 = greater than 4< (absolute); No value = 0 = no boating allowed</p>	<p>By-laws recorded by JBNZ</p>

<p>Access</p>	<p>Ability to launch a jet boat near or within a boatable reach</p>	<p>Number and reliability of boat launching sites per reach</p>	<p>Quality and reliability of access – combination of number of access points, whether they are useable or not and whether they are appropriately located relative to the boatable reach</p>	<p>High = Reliable (1 or more access points that are normally available for use) = 3; Medium = access not within reach but reach able to be accessed from other reach = 2; Low = Unreliable (1 or less (within the reach) access points that are very unreliable) = 1; None = 0</p>	<p>JBNZ, EP knowledge</p>
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APPENDIX 3: ASSESSMENT OF INDICATORS BY SMARTA CRITERIA

Indicator	Specific	Measurable	Achievable	Relevant	Timely	Already in use
1. Number of jet boater days per annum	Yes	Number	Jet boating NZ or expert panel data	Direct bearing on relative use and importance	Data available	Some data already collected
2. Jet boater's home district/region	Yes	Proportional	Jet boating NZ or expert panel data	Direct bearing on relative importance	Data available	Available from EP
3. Range of uses	Yes	Number	Jet boating NZ or expert panel data	Direct bearing on relative importance	Data available	Available from EP
4. Number and type of events	Yes	Number and diversity	Jet boating NZ or expert panel data	Direct bearing on relative importance	Data available	Available from EP
5. Percent of time river is jet boatable	Yes	Proportional	Jet boating NZ or expert panel data and ECan flow data	Directly related to potential to use the river section	Data available	Available from EP
6. Quality of on-water experience	Yes	Likert scale	Jet boating NZ or expert panel data	Direct bearing on relative importance	Data available	Available from EP
7. Perception of scenic attractiveness	Yes	Likert scale	Jet boating NZ or expert panel data	Direct bearing on relative importance	Data available	Available from EP
8. Legality of jet boating	Yes	Published regulations	Regulations	Directly related to potential to use the river section	Data available	Published regulations
9. Availability and Reliability of access	Yes	Number and perception	Jet boating NZ or expert panel data	Direct bearing on relative importance	Data available	Available from EP

APPENDIX 4: SIGNIFICANCE ASSESSMENT CALCULATIONS FOR JET BOATING (RIVAS) (STEPS 1 AND 5-8) (DATA IN RED IS EXPERT PANEL-DERIVED) – NOTE THAT TABLE IS ESSENTIALLY SPLIT INTO TWO PARTS – THE RIVAS RAW DATA (PP17-20); THE THRESHOLD APPLICATIONS AND OVERALL ASSESSMENT AND RANKINGS (PP21-24)

Primary Attributes											
River	Reach	Level of use	Origin of users	Organised Events	Quality of on-water experience	Flow reliability in peak boating times (e.g., Oct-Mar)	Comment	Diversity of uses	Scenic attractiveness	Regulatory considerations	Access (legal and physical - reliability)
		User days per year (number on boat) (Commercial use – sourced from business operators)	3=(International), National, Regional and Local; 2 = Regional and Local; 1=Local	3 = Int, Nation, Region. Local and family; 2 = regional, local and family; 1 = local and family; 0= no events	3 = rare, challenging, remote, bucket list, one of a kind; 2 = something a bit special; 1= everyday boating river	% of time river is jet boatable. Bands of 10%	Comment about effects of low and high flows	Range of uses: Commercial (C), Hunting (H), Trout fishing (TF), White baiting (WB), Racing (R), Family (F), Salmon fishing (SF), Adventure boating (AB), Duck hunting (DH), Tramping (T), Access (A), Search and rescue (S&R), Training (Tr), Industry (I)	Jet boater's perception of scenic attractiveness. 1=Uninspiring to 5 = Inspiring	3 = no restrictions; 2 = less than 4 months of seasonal limits; 1 = greater than 4<absolute); 0 = no boating allowed	Reliable = 3; Unreliable = 1; None = 0 (1 (L=1 or 0); (P=1 or 0); (N=?)
		EP estimate; + commercial	EP estimate	Calendar of Events	EP estimate	EP estimate		EP estimate	EP estimate	Regulations	EP estimate
Waimakariri	Poulter to Woodstock (Gorge)	5000 + 7500 commercial	3	3	3	95	Flood	TF, SF, FB, R, T, S&R, C	5	3	3
Rakaia	Wilberforce to Gorge Bridge	5000 + 7500 commercial	3	3	3	95	Flood	SF, TF, FB, R, C, T, S&R, Tr	5	3	3
Waimakariri	Woodstock to Sea (Lower) SH1 bridge	15000 + 1000 commercial	3	3	3	95	Flood	TF, SF, FB, M, R, Tr, S&R, C, I	2	3	3

Waiau	Confluence of Hope & Waiau to Leslie Hills	2500 + 5000 commercial	3	3	2	80	Flood	C, TF, SF, FB, R	4	3	3
Rakaia	Lower Rakaia River below Gorge	10000	3	3	2	95	Flood	SF, FB, R, TF, WB, S&R, Tr, DH	3	3	3
Lower Waitaki	Bells Pond to sea	12000	3	3	2	95	Flood	TF, SF, DH, FB, R, F, SAR	2	3	2
Lower Waitaki	Waitaki Dam to Bells Pond	3000	2	3	2	95	Flood	TF, SF, DH, FB, R, SAR	2	3	3
Waiau	Leslie Hills to Sea	700	3	3	2	40	Too low, rocky	C, H, SF, TF, WB, R	4	3	2
Upper Waitaki	Dobson/Hopkins - Watsons stream to Lake Ohau	300	2	2	2	70	Low flow	AB, FB, H, TF	5	2	3
Rangitata	Upper braided	1000	2	2	2	95	Flood	FB, SF, TF, H	5	2	2
Rakaia	Above Wilberforce confluence	100	2	2	2	70	Low flow	TF, A, FB, AB	5	2	2
Upper Waitaki	Godley - McKinnon Stream to Lake Tekapo	100	2	2	3	70	Low flow	FB, AB	5	2	2?
Rangitata	Lower Rangitata - SH1 to sea	400	2	0	2	70	Low flow/rocks/ slope	SF, WB, TF, FB, DH	2	3	3
Clarence	Overall	100	2	1	3	20	Low river flows	AB, H, TF, SF	5	3	1
Ashley	Upper (Gillespie's Bridge to Camp ground/Gorge Bridge)	10	2	0	3	5	Low flow	AB	4	3	3
Hurunui	Mandamus to Sea	500	2	1	2	30	Low flow	TF, SF, FB	2	3	2
Hurunui	Lake Sumner to Mandamus	100	2	0	3	10	Low flow	AB	5	3	2

Waipara		40	2	0	2	5	Low flow	AB	3	3	3
Rangitata	Top of Gorge to RDR Intake	2	1	0	3	5	Gnarly	AB	5	3	2
Upper Waitaki	Pukaki - Pukaki dam to Tekapo Junction	60	2	1	3	5	Dry	AB, FB	2	1	3
Rangitata	Clyde & Havelock confluence to top	10	2	0	2	20	Low flow	AB, H	5	2	2
Waimakariri	NP Boundary to Poulter (Upper W)	100	2	0	2	20	Low flow	FB	4	2	2
Waiau	Edwards to Hope Confluence	50	2	0	2	20	Low flow	H, AB, TF	5	3	1
Hurunui	North Branch - No. 3 Hut to Late Sumner	<50	2	0	2	10	Too low & weather	FB	5	3	1?
Rangitata	Mid-low Rangitata - RDR to SH1	20	2	0	2	5	Low flow/rocks/slope	AB	2	3	3
Waimakariri	Poulter	<10	1	0	2	30	Low flow	AB	4	2	2
Kahutara		<10	1	0	2	5	Too low	AB	2	3	3
Conway	Source to Sea	20	1	0	2	5	Too low	AB	2	3	3
Ashley	Lower (Ashley Gorge to Sea)	200	2	0	2	15	Low flow	AB	2	3	2
Ashburton	North Branch	10	2	0	2	5	Low flow	FB, AB	2	3	2
Ashburton	South Ashburton	20	2	0	2	10	Low flow	FB, AB	2	3	2
Ashburton	Sea to North and South Branch confluence	40	2	0	2	10	Low flow	FB	2	3	2
Waiau	Hope and Boyle	10	2	0	2	10	Low flow	AB	4	1	1

Opihi	Boatable from Rockwood Bridge to Estuary	50	1	1	1	5	Too low	AB	3	2 (2-day window Sept-Feb)	3
Upper Waitaki	Tekapo Section 1 - Lake George Scott Weir to Iron Bridge	100?	2	0	2	20	20 cumec min for whole Tekapo	AB	2	1	3
Upper Waitaki	Tekapo Section 2 - Lake Benmore to Iron Bridge	300+?	2	1	1	20	20 cumec min for whole Tekapo	AB, FB	2	1	3
Waihao		10	1	0	1	5	Too low; too many willows	AB	1	3	3
Otaio		5	1	0	1	5	Too low, too small	AB	1	3	3
Makikihi		5	1	0	1	5	Too low, too small	AB	1	3	3

Threshold applications (Steps 0, 1-3)													
River	Reach	Level of use	Origin of users	Organised Events	Quality of experience	Flow reliability in peak boating times (e.g., Oct-Mar)	Diversity of uses	Scenic attractiveness	Regulatory considerations	Access	Weighting	Significance	Comment
		High: >2000 jet boater days per annum (score: 3); Medium: 500-2000 jet boater days per annum (score: 2); Low: <500 jet boater days per annum (score: 1)	3= (International), National, Regional and Local; 2 = Regional and Local; 1=Local	3 = Int, Nation, Region. Local and family; 2 = regional, local and family; 1 = local and family; 0= no events	3 = rare, challenging, remote, bucket list, one of a kind; 2 = something a bit special; 1= everyday boating river	High: >66% (score: 3); Medium: 33-66% (score: 2); Low: <33% (score: 1)	3= >5; 2= 3-5; 1=<3	High: Very or highly inspiring (score: 3); Medium inspiring (score: 2); Low: Low or little inspiration (score: 1)	3 = no restrictions ; 2 = less than 4 months of seasonal limits; 1 = greater than 4<absolute ; 0 = no boating allowed	Reliable = 3; Unreliable = 1; None = 0 (1 (L=1 or 0); (P=1 or 0); (N=?))	Flow*2; Regulation /2		
Waimakariri	Poulter to Woodstock (Gorge)	3	3	3	3	3	3	3	3	3	28.5	National	
Rakaia	Wilberforce to Gorge Bridge	3	3	3	3	3	3	3	3	3	28.5	National	
Waimakariri	Woodstock to Sea (Lower) SH1 bridge	3	3	3	3	3	3	1	3	3	26.5	National	
Waiiau	Confluence of Hope & Waiiau to Leslie Hills	3	3	3	2	3	2	3	3	3	26.5	National	
Rakaia	Lower Rakaia River below Gorge	3	3	3	2	3	3	2	3	3	26.5	National	
Lower Waitaki	Bells Pond to sea	3	3	3	2	3	3	1	3	2	24.5	National	

Lower Waitaki	Waitaki Dam to Bells Pond	3	2	3	2	3	3	1	3	2	23.5	National	
Waiiau	Leslie Hills to Sea	2	3	3	2	2	3	2	3	2	22.5	National	Trying to organise events but low flow challenges
Upper Waitaki	Dobson/Hopkins - Watsons stream to Lake Ohau	1	2	2	2	3	2	3	2	3	22	National	
Rangitata	Upper braided	2	2	2	2	3	2	3	2	2	22	National	
Rakaia	Above Wilberforce confluence	1	2	2	2	3	2	3	2	2	21	Regional	
Upper Waitaki	Godley - McKinnon Stream to Lake Tekapo	1	2	2	3	3	1	3	2	2	21	Regional	Not sure of launch site
Rangitata	Lower Rangitata - SH1 to sea	1	2	0	2	3	2	1	3	3	18.5	Regional	
Clarence	Overall	1	2	1	3	1	2	3	3	1	16.5	Regional	Trying to organise events but low flow challenges
Ashley	Upper (Gillespie's Bridge to Camp ground/Gorge Bridge)	1	2	0	3	1	1	3	3	3	16.5	Regional	
Hurunui	Mandamus to Sea	2	2	1	2	1	2	2	3	2	16.5	Regional	
Hurunui	Lake Sumner to Mandamus	1	2	0	3	1	1	3	3	2	15.5	Regional	
Waipara		1	2	0	2	1	1	2	3	3	14.5	Regional	
Rangitata	Section 3 - Top Gorge to Intake	1	1	0	3	1	1	3	3	2	14.5	Regional	

Upper Waitaki	Pukaki - Pukaki dam to Tekapo Junction	1	1	2	3	1	1	1	1	3	14.5	Regional	Can legally use river on the 2 release weekends, started 2015
Rangitata	Clyde & Havelock confluence to top	1	2	0	2	1	1	3	2	2	14	Local	
Waimakariri	NP Boundary to Poulter (Upper W)	1	2	0	2	1	1	3	2	2	14	Local	
Waiiau	Edwards to Hope Confluence	1	2	0	2	1	1	3	3	1	13.5	Local	
Hurunui	North Branch - No. 3 Hut to Late Sumer	1	2	0	2	1	1	3	3	1	13.5	Local	
Rangitata	Mid-low Rangitata - RDR to SH1	1	2	0	2	1	1	1	3	3	13.5	Local	
Waimakariri	Poulter	1	1	0	2	1	1	3	2	2	13	Local	
Kahutara		1	1	0	2	1	1	1	3	3	12.5	Local	
Conway	Source to Sea	1	1	0	2	1	1	1	3	3	12.5	Local	
Ashley	Lower (Ashley Gorge to Sea)	1	2	0	2	1	1	1	3	2	12.5	Local	Fencing by ECan restricting access at Rangiora
Ashburton	North	1	2	0	2	1	1	1	3	2	12.5	Local	
Ashburton	South Ashburton	1	2	0	2	1	1	1	3	2	12.5	Local	
Ashburton	Sea to North and South Branch confluence	1	2	0	2	1	1	1	3	2	12.5	Local	
Waiiau	Hope and Boyle	1	2	0	2	1	1	3	1	1	12.5	Local	

Opihi	Boatable from Rockwood Bridge to Estuary	1	1	1	1	1	1	2	1	3	12.5	Local	
Upper Waitaki	Tekapo Section 1 - Lake George Scott Weir to Iron Bridge	1	2	0	2	1	1	1	1	3	12.5	Local	Ask ZC or motor camp; uplifting only 2015 - new boating
Upper Waitaki	Tekapo Section 2 - Lake Benmore to Iron Bridge	1	2	1	1	1	1	1	1	3	12.5	Local	
Waihao		1	1	0	1	1	1	1	3	3	11.5	Local	
Otaio		1	1	0	1	1	1	1	2	3	11	Local	
Makikihi		1	1	0	1	1	1	1	2	3	11	Local	

APPENDIX 5: RIVERS CURRENTLY PRECLUDED FROM JET BOATING BUT WHICH COULD BE BOATED, AND THERE IS A PERCEIVED DEMAND, IF UPLIFTING OCCURRED

River	Reach	Comments
Hurunui	South Branch	Possible at right flow but Godley preferred
Selwyn	Whitecliffs to Leeston Highway Bridge	Unboatable
Selwyn	Leeston Bridge to Lake Ellesmere	Unboatable
Upper Waitaki	MacCauley - North Branch Junction to Lake Tekapo	Heavily fished; choked with willows, unboatable
Upper Waitaki	Ohau - upper	Not boated due to restrictions
Upper Waitaki	Ohau - lower	High demand site - hundreds would use it if uplifted
Hakataramea		Needs high flows; occasionally used for commercial boat testing
Upper Waitaki	Ahuriri - above South Diadem Recorder	Needs high flows
Upper Waitaki	Ahuriri - South Diadem Recorder to lake	Needs high flows
Orari	Orari River	Possible at right flow but Godley preferred
Upper Waitaki	Tasman - Tasman Glacier to Pukaki	Boated at least once by permit but required helicopter recovery of boats as they were unable to navigate downstream
Pareora		Unboatable