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**RiVAS (and RiVAS+): Insights and  
lessons from 5 years' experience with the  
River Values Assessment System**

**Ken Hughey**

Faculty of Environment, Society and Design  
Lincoln University

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# **RiVAS (and RiVAS+): Insights and lessons from 5 years' experience with the River Values Assessment System**

**Kenneth FD Hughey**

**Faculty of Environment, Society and Design, PO Box 84, Lincoln University, Lincoln  
7647, Christchurch, New Zealand**

## **Summary**

The River Values Assessment System (RiVAS and RiVAS+) are tools that enable regional councils and others to 'objectively' and systematically evaluate rivers in their regions for their relative importance across the range of river values (e.g., native birds, irrigation and tangata whenau). RiVAS (which assesses existing importance) has been applied to 11 values, and to a large number of these in each of three regions (Tasman, Gisborne and Hawke's Bay). RiVAS+ (restoration potential) has had limited application. There are multiple insights from these applications. First, RiVAS and RiVAS+ are highly cost effective. At around \$6000 per value-application councils obtain: a collaborative approach resulting in stronger relationships between councils and stakeholder groups; up to date (and user friendly and accessible) information on value-related data often never collected otherwise; lists of rivers ranked according to national (high), regional (moderate) and low (importance) using the same method; indications of where the best prospects for restoration activities exist; and information that is immediately useful in the broader policy making processes. The paper reports also on the strengths, weaknesses, threats and opportunities associated with ongoing application of the tool.

**Key words:** River values, multi criteria analysis, prioritisation, evaluation, New Zealand

## **Introduction**

The River Values Assessment System (RiVAS) (Hughey and Baker 2010) began its genesis in 2008 as a response to the continuing need for Councils and others to have a cost effective tool that enables the range of river values (e.g., irrigation, native fish and swimming) to be ranked for importance across all rivers in a region. RiVAS has been applied to 11 values, and almost fully in three regions (Tasman (TDC), Gisborne (GDC) and Hawkes Bay (HBRC)) and was extended in 2011 to consider potential (restoration) value (RiVAS+). As development has proceeded and a range of policy applications considered, so too has the strengths, weaknesses and further opportunities of RiVAS and RiVAS+ been exposed. In this paper I review what has been learnt from the system with emphasis on further opportunities. The paper begins first with a brief description of the system; this is followed by an overview of key findings and an evaluation of the practical application of the system (informed by a survey of the key policy users in TDC, GDC and HBRC undertaken in August 2012); finally, insights are identified that then lead to short set of conclusions.

## **Description of RiVAS and RiVAS+**

Hughey and Booth (In press) describe RiVAS as a Multi Criteria Analysis based tool that enables any set of rivers to be prioritised for any specified value, where a value is a river-

related tangible resource (e.g., native birdlife), activity (e.g., salmonid angling or swimming), or resource use (e.g., irrigation). Key components of the tool are:

- It is expert panel based and uses the best available information.
- Primary attributes (between 6-10) are identified to describe the value and a key indicator for each attribute is identified and populated.
- Thresholds of high, medium and low relative importance are defined for each indicator's raw data – these are converted to numeric scales of, typically, 3 to 1 for high to low importance respectively.
- The sum of these numeric scores (sometimes weighted depending on attribute relative importance) forms the basis for the comparative importance ranking of rivers for this value.
- Predetermined criteria to define national, regional or local importance, or high, medium or low importance (depending on the value and related legal/policy issues) identify significance.
- The end result is a list of ranked rivers for that value, produced on a regional basis.

Based on the above, the RiVAS methodology (or tool) comprises 10 steps (Table 1). RiVAS+ builds on this tool by adding 4 steps which allow potential (restoration) value to be considered. The key additional steps in RiVAS+ are:

- The identification of interventions, essentially a list of actions one or more of which if implemented will lead to a positive change in an indicator score
- The scoring of indicators which can only occur on the 1-3 threshold scale, given they have yet to be achieved.

Table 1: Steps in the RiVAS and RiVAS+ method(s).

Step	Purpose
<b>RiVAS</b>	
1 Define river value categories and river segments	The river value may be subdivided into categories to ensure the method is applied at a meaningful level of detail, e.g., whitewater kayaking cf kayaking. Rivers are listed and may be subdivided into segments or aggregated into clusters to ensure that the rivers/segments being scored and ranked are appropriate for the value being assessed. A preliminary scan of rivers in the region is undertaken to remove those rivers considered to be of 'no' or less-than-local level significance for the value being considered.
2 Identify attributes	All attributes are listed to ensure that decision-makers are cognisant of the various aspects that characterise the river value.
3 Select and describe the primary attributes	A subset of attributes (called primary attributes) is selected and described.
4 Identify indicators	An indicator is identified for each primary attribute using SMARTA criteria. Quantitative criteria are used where possible.
5 Determine indicator thresholds	Thresholds are identified for each indicator to convert indicator raw data to 'not present', 'low', 'medium', 'high' (scores 0-3)
6 Apply indicators and indicator thresholds	Indicators are populated with data (or data estimates from an expert panel) for each river. A threshold score is assigned for each indicator for each river.

<b>Step</b>	<b>Purpose</b>
7 Weight the primary attributes	Primary attributes are weighted. Weights reflect the relative contribution of each primary attribute to the river value. The default is that all primary attributes are weighted equally.
8 Determine river significance	Indicator threshold scores are summed to give a significance score (weightings applied where relevant). Rivers are ordered by their significance scores to provide a list of rivers ranked by their significance for the river value under examination. Significance (national, regional, local) is assigned based on a set of criteria or cut off points.
9 Outline other relevant factors	Factors which cannot be quantified but influence significance are recorded to inform decision-making, e.g., particular legal or policy issues such as presence of a Water Conservation Order.
10 Method review - review assessment process and identify future information needs	Data desirable for assessment purposes (but not currently available) are listed to inform a river value research strategy.
<b>RiVAS+</b>	
11 Identify rivers and interventions	From the RiVAS list identify those rivers with potential for improvement/restoration. Identify the interventions for each river that would lead to a change in condition of indicators.
12 Apply indicators and indicator thresholds for potential value	Score the indicators in terms of change and against the thresholds used in RiVAS.
13 Weight the primary attributes for potential value	Adopt the same weightings used in RiVAS.
14 Determine river potential value	Indicator threshold scores are summed to give a significance score (weightings applied where relevant). Rivers are ordered by their significance scores to provide a list of rivers ranked by their significance for the river value under examination. Significance (national, regional, local) is assigned based on a set of criteria or cut off points.

Implementation of RiVAS and RiVAS+ is based on an Expert Panel (EP) approach. National level EPs initially identify the primary attributes, indicators, thresholds and relative significance criteria for each new value. Regional EPs then undertake the regional value-specific applications. The methods are described fully in Hughey et al. (2010). All applications are reported individually and most reports can be sourced electronically at <http://www.lincoln.ac.nz/Research-Centres/LEaP/Environmental-Management--Planning/Projects/Prioritising-river-values/>.

## Findings

### History and geography of RiVAS and RiVAS+ applications

RiVAS and RiVAS+ have been applied in multiple contexts and settings (Table 2). The first RiVAS applications of most values were at ‘volunteer’ regions, including Tasman – subsequent, more complete sets of applications have occurred also in Hawkes Bay and Gisborne councils. The complementary RiVAS+ has had limited application although it has been operationalised on five values in Gisborne District.

Table 2. Summary locations and years of RiVAS and RiVAS+ applications.

Value cluster	Value	Tasman DC		Hawkes Bay RC		Gisborne DC		Other Council	
		RiVAS	RiVAS+	RiVAS	RiVAS+	RiVAS	RiVAS+	RiVAS	RiVAS+
Recreation	Salmonid angling	Y 2008 (1)		Y 2012 (3)		Y 2012 (4)	Y 2012 (1)	Marlborough 2010 (2)	
	Swimming	Y 2010 (2)		Y 2012 (3)	Y 2012 (1)	Y 2012 (4)	Y 2012 (2)	Manawatu (1)	
	White-water kayaking	Y 2012 (3)		Y 2012 (2)				West Coast 2010 (1)	
	White baiting	Draft criteria 2011							
Ecological	Natural character	Y 2010 (2)		Y 2012 (3)	Y (1)	Y (4)	Y (2)	Marlborough 2010 (1)	
	Native birds	Y 2010 (2)		Y 2012 (3)	Y 2012 (1)	Y 2012 (4)	Y 2012 (2)	Canterbury – 2009 (1)	
	Native fish	Y 2012 in prep	Y 2012 in prep	Y 2012 in press	Y 2012 in press	Y 2012 (1)	Y 2012 (1)		
Cultural	Tangata whenua							Southland 2010	
Develop- ment	Irrigation	Y 2010 (2)		Y 2012 (4)		Y 2012 (3)		Canterbury 2009 (1)	
	Hydro							NZ – various rivers - 2011	NZ – various rivers - 2011
	Potable water					Y 2012	Y 2012		
Total		7	1	7	4	7	6	7	1

### What RiVAS and RiVAS+ can tell us - examples

As predicted, and desired, RiVAS does deliver lists of rivers by value, prioritised in terms of relative importance. What has been interesting about these lists is that when the ‘national’/‘high’ ranked rivers/clusters (of like rivers)/sections (of particular rivers) are mapped there is often little or no overlap between the values, e.g., the nationally important salmonid (trout) angling rivers in GDC are isolated backcountry rivers whereas the regionally important irrigation river is a predominantly low country catchment on the Poverty Bay Plain.

This finding is important because at least for these ‘nationally’ important values it should be relatively straight forward for councils to develop policies that will protect the value for the utility (whether ‘preservation’ or ‘use’) it provides. Where trade off considerations are most likely to occur is where regional importance overlaps between values, or where national and regional importance overlap. Again, it should be possible to develop policies that deal with both these instances. Probably the greatest challenge occurs and not surprisingly, where national (in and out of stream) rankings occur for two values over the same sections of the river – so far there have been few examples of this occurring (but do for example on the Rakaia River in Canterbury where native birds and irrigation, the two values so far applied in Canterbury, are nationally important).

One question sometimes posed has been around the issue of proportionality, i.e., what proportion of rivers should be deemed as being of national, regional or local importance? Figure 1 shows the average proportion of rivers for each value in each of the national, regional and local importance categories. Natural character and whitewater kayaking at around 40% have the highest proportions considered of national importance and swimming the lowest. These summary data have to be viewed with care. First, for swimming, it was decided early on that there would be no swimming river or part thereof that would be nationally important; and second, averages hide variation between regions. So, Figure 2 plots the regional data (and the mean) for native birds with the regions ranked from those having the most nationally important rivers to those with the least – Canterbury is almost universally regarded as having the largest number and the most important native bird rivers in New Zealand while not surprisingly, at least to ornithologists, is that of the four regions studied Gisborne (with few braided rivers) has none. Similar conclusions can be drawn about patterns for the other values. Such conclusions indicate RiVAS rankings make sense.

Figure 1: Mean proportion of rivers/segments or clusters in each importance category for each value assessed.

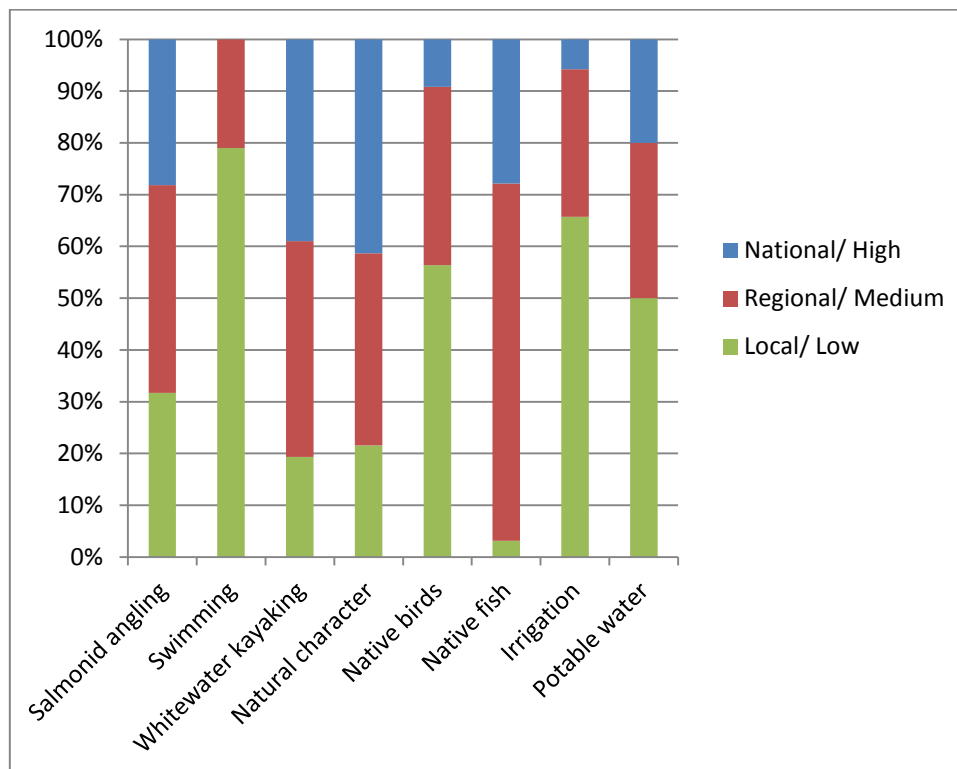
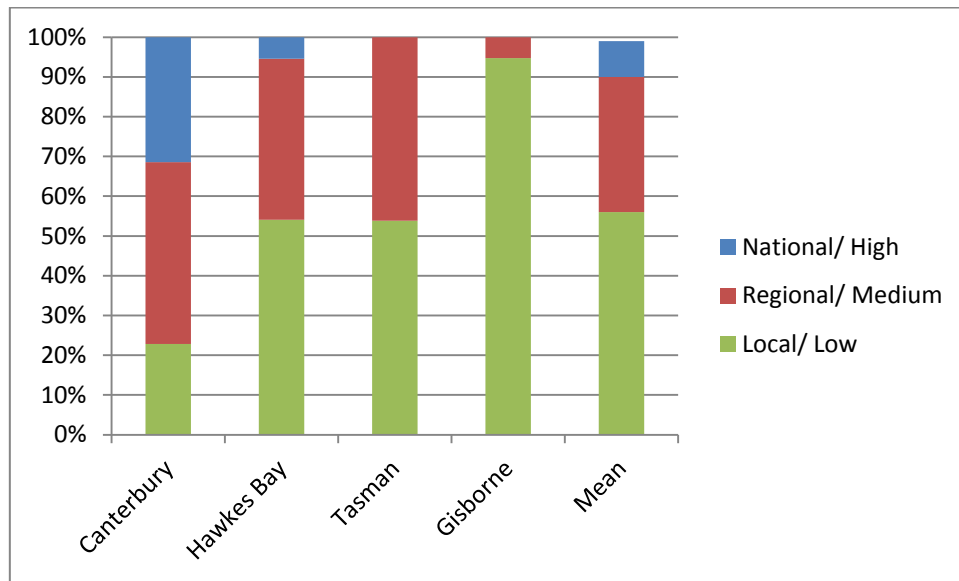


Figure 2: Importance rankings for native bird rivers from four RiVAS applications.



### RiVAS uses

Apart from the measure of relative importance, the RiVAS' main aim, examples of what RiVAS can otherwise deliver include:

- Use by river – native bird numbers, native fish numbers, swimmers and kayaker numbers
- Origin of users by river – swimming, salmonid angling, kayaking
- Lists of species by river, i.e., diversity attributes and indicators – native birds, native fish
- Threatened species aspects by river, e.g., presence of threatened or at risk species and whether or not river is a species stronghold – native fish, native birds
- Measures of water quality by river, i.e., attributes and indicators for native fish, natural character, salmonid angling and swimming
- River morphology, e.g., distribution and abundance of whitewater features used by kayakers.

Many of the above examples incorporate the use of indicators that have uses broader than the original RiVAS intention. To this end, Hughey and Booth (in press) have identified the range of indicators, by value, that should be considered for a range of local and regional monitoring contexts.

### RiVAS+ uses

It is not possible to deliver the same detail for RiVAS+, i.e., it is looking at future value but without being able to define absolute numbers for most indicators. Nevertheless RiVAS+ has delivered information of use to managers:

- Ideas about the most 'cost effective' measures (interventions) that would improve rivers for particular values, e.g., for native fish it is clear that fencing off inanga spawning areas would deliver the single biggest return for the smallest investment
- Identification of particular rivers where the biggest possible gains can be made.



## **Cost and time-effectiveness**

A typical RiVAS and RiVAS+ application costs (for the consultancy component) in the order of \$6000 per value per council to implement (range roughly \$5-13,000). The addition of some other costs in terms of council staff time (organising the EP, experts in their own right, meeting room, lunches, etc) would likely add another \$1-3000 to these costs, i.e., an average of about \$7-8000. If a council invests in 5-10 applications then they face a cost of \$35-80,000. Compared to other similar exercises this is extremely cost effective and in addition provides council with a publishable report on each value and material that can be used immediately in the policy and planning process.

In terms of time – the first application to a new value always takes longer than subsequent applications. This is not surprising given the need to establish a national panel, convene the panel, write a draft report, get the report peer reviewed, etc. Total consultant time is likely in the order of 3-5 days for these first applications over an elapsed time period of several months. For subsequent applications total elapsed time can be very short, although there can also be issues. Once a regional expert panel is organised and the meeting convened all meetings take a day or less, the report can be (and sometimes is) drafted the next day and then it does a round of the EP. It is at this latter point where sometimes delays can occur – EP members are often otherwise distracted by other work or it simply is not a priority. Considerable follow up can be required at this point, but again this varies. The final time issue revolves around report publication – the more recent RiVAS and RiVAS+ reports are now including maps and these take time to generate, and the publication process itself takes time. Despite these constraints council staff have found that with care they can use information immediately based on that contained in the draft reports, i.e., often 1 day or so after the workshop!

## **Development issues**

### **Expert panels**

It was always known that composition of the EPs would be important. Despite this acknowledgement there have been instances where panels proved difficult to manage, typically as the result of one person. Characteristics of these challenging individuals:

- Unwillingness to work in a group for a consensus decision
- Wanting to reinvent the attributes and indicators, or on some occasions the foundations of the entire method
- Not willing to share data.

One result of these issues has been a few circumstances where aspects of the integrity of the method for particular value-specific applications may have been compromised, i.e., it was better to proceed and to compromise than to abandon the application totally.

### **Stakeholder reaction and suspicion**

Mostly there has been very enthusiastic and positive support for RiVAS and to a lesser degree for RiVAS+. The diverse range of stakeholders have appreciated the opportunity to participate, they understand how the system works, and they see its immediate benefits.

There has been some negative reaction. Development and implementation of RiVAS appears almost to have caught some people 'off guard' and it has prompted threat-type reactions. One player in one industry responded with letters from their lawyers when we attempted a RiVAS exercise in its region for 'its' value. One recreation group, largely prompted by one

individual, hugely criticised Multi Criteria Analysis as a method and described it as a ‘fake’ science – this took considerable effort to attempt to resolve.

Central government, apart from hosting some workshops at MfE, appears largely oblivious to the obvious potential of RiVAS. This appears surprising given the very large amount of resource spent on other prioritisation exercises in the past, most of which have failed to deliver the sort of results and utility that RiVAS has. DoC has contributed positively, especially with the native fish applications. On the other hand it is unsurprising – RiVAS is a tool and central government is preoccupied, probably rightfully, with policy – where the two intersect there is clearly a government role to be played.

For Iwi it appears almost any ranking system can be a challenge when everything is nationally important to them. This issue was overcome in Southland but has been a challenge in some parts of other regions.

### **The rationale for RiVAS+ as a complement to RiVAS**

RiVAS+ was invented to deal with the situation where most instream values were essentially being evaluated on the basis of existing (often degraded) value, whereas out of stream interests were largely evaluated on the basis of projected future (developed) value. This situation, it was argued, created issues for the ongoing utility of RiVAS. To attempt to respond to this issue RiVAS+ was developed – essentially it involved selecting management interventions and determining the effect they would have on the importance of the value if implemented.

RiVAS+ has now been applied to six values, mostly in Gisborne District and to a lesser extent in Hawkes Bay and Tasman. While most EP members have supported the concept there are obvious issues:

- Experience has shown some participants to be sceptical about its utility
- In very few situations has it changed the ultimate ranking of a river
- It is challenging to fit both RiVAS (the key first building block) and RiVAS+ into the same workshop in one day – participant fatigue is a challenge that is difficult to resolve
- Despite advice to be ‘realistic’ in terms of RiVAS+ interventions it is clear from observation that this can be a challenge – and, clearly, no formal Cost Effectiveness Analysis (CEA) has been undertaken.

## **Participant council evaluation**

All three councils (GDC, TDC, HBRC) responded to a short questionnaire about their ‘views’ on RiVAS and RiVAS+. Each was provided with templates that asked them to identify:

- What RiVAS and RiVAS+ was being applied to,
  - The extent of complementarity with other tools,
  - Strengths, Weaknesses, Opportunities and Threats,
- each in the context of policy/planning, research/survey/monitoring, and other uses.

## RiVAS – an evaluation

Applications of RiVAS are shown in Tables 3. Tasman, the council with most involvement with method development has also clearly been to the fore in ‘inventing’ diverse uses of RiVAS, across the planning and research spectrums. The use of RiVAS to identify monitoring needs for swimming was never envisaged in the development process.

Table 3: Applications of RiVAS within Tasman, Gisborne and Hawkes Bay regions.

	<b>Policy / planning</b>	<b>Research / survey / monitoring</b>	<b>Other</b>
Applied to (type of policy or plan; specific survey need etc):	<ul style="list-style-type: none"> <li>• TDC: Provide additional information about known uses and values in the form of a fairly rudimentary list in TDC regional plan.</li> <li>• GDC: Regional Fresh Water Management Planning</li> <li>• HBRC: Four of the seven RiVAS applications implemented in Hawke’s Bay (angling, kayaking, swimming and natural character) were used to inform the decision making for the RPS Change 5 – Land and Water.</li> </ul>	<ul style="list-style-type: none"> <li>• Informed annual bathing water quality survey (TDC).</li> <li>• HBRC: RiVAS results will inform water quality monitoring site locations for contact recreation</li> </ul>	<ul style="list-style-type: none"> <li>• TDC: Identified where potential conflicts are likely to arise at a water management objective level.</li> <li>• HBRC: The RiVAS outputs have been used extensively in community and stakeholder engagement to demonstrate how freshwater values vary throughout the region. The maps in particular have been used to highlight the challenge of managing water abstraction and water quality and the need to balance values. The results have been well received and considered to be very accurate by local people involved in the various activities.</li> </ul>
Complementary to (other approaches, e.g., REC, IFIM):	<ul style="list-style-type: none"> <li>• GDC: Used RiVAS in combination with River Environment Classification and Instream Flow Methodology predictions to propose a plan for the Waipaoa River</li> </ul>	<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• TDC: Yet to see how the RiVAS outputs are going to be displayed via our GIS. Can see the REC providing some assistance.</li> <li>• TDC: Preparing a strategy/ guidance document in relation to reserve management and esplanade reserve policy. Outputs from RiVAS will be taken into account in considering priorities for action/key locations etc.</li> </ul>

The SWOT analysis of RiVAS is enlightening, as shown in Tables 4, 5, 6 and 7. Key strengths of RiVAS include its standard and defensible method, its ability to assist with identifying research and monitoring requirements (e.g., as highlighted by swimming) and its relative cost effectiveness and ability to promote engagement between council, technical experts and lay experts.

Table 4: Strengths of RiVAS in a range of council applications.

<b>Policy / planning</b>	<b>Research / survey / monitoring</b>	<b>Other</b>
<ul style="list-style-type: none"> <li>• TDC: Neutral methodology using available information.</li> <li>• TDC: Robust enough to be applied by any party. (At least one environmental consultant is applying it as part of work being done for a commercial client).</li> <li>• TDC: Makes no water management judgements or decisions – it’s a good tool to assemble crucial information.</li> <li>• TDC: Enables assessment even in absence of hard data.</li> <li>• TDC: Can be used for a variety of end uses (e.g., Plan preparation-deciding on water management objectives, assessing impacts of resource consent applications, prioritising work).</li> <li>• GDC: Really useful for Gisborne as we rely heavily on experts to fill in information gaps.</li> <li>• GDC: Cost effective way of highlighting conflicts on rivers and focusing on what further information needs to be gathered.</li> <li>• GDC: A really good way to engage the community and start a dialogue and get people in a room together.</li> <li>• HBRC: Rare to get experts in a room with a workable and accepted methodology</li> <li>• HBRC: Extremely cost effective and time efficient to get expertly assessed outputs in a one day workshop</li> <li>• HBRC: Provides a wide-lens approach, regionwide - useful for community engagement where we can be criticised for having a narrow focus on the more heavily populated areas.</li> <li>• HBRC: Simple to use</li> <li>• HBRC: Despite initial concern for being too cursory an assessment it is well received by experts involved in workshops</li> <li>• HBRC: Consistent methodology</li> <li>• HBRC: Useful for informing national and regional decision- making</li> </ul>	<ul style="list-style-type: none"> <li>• Highlights key water body attributes that may require particular management (e.g., the swimming values highlighted the importance of adjacent facilities).</li> <li>• Enables clustering of key attributes that may need to be addressed in monitoring/data gathering/ investigation programmes– water quality is the obvious parameter but bank vegetation might be another.</li> <li>• Highlights gaps in knowledge/data needed to manage rivers for particular end uses</li> <li>• Prioritising work programmes</li> </ul>	<ul style="list-style-type: none"> <li>• Can be applied in cost effective, relatively short time.</li> <li>• Local people with local expert knowledge can be part of process – great opportunity for engagement</li> </ul>

RiVAS has weaknesses (Table 5), most of which have been apparent from early in its development, e.g., both the role of the EP and the importance of having the ‘right’ people on the panel – as already noted one sceptical person can effectively almost derail an application.

Table 5: Weaknesses identified in RiVAS.

<b>Policy / planning</b>	<b>Other</b>
<ul style="list-style-type: none"> <li>• TDC: People especially buy in to the methodology only when they have been part of the process. ‘Outsiders’ can remain skeptical.</li> <li>• TDC: Tendency for people to assume a water management decision has been made with the ranking.</li> <li>• TDC: Expert panel approach – very dependent on getting the ‘right’ people.</li> <li>• TDC: Lack of actual data for some values</li> <li>• TDC: The need to ensure the ‘value’ is properly understood/defined. Cf the debate about ‘irrigation’ versus ‘primary production’.</li> <li>• TDC: The development process didn’t really allow other stakeholder input into its acceptability.</li> <li>• GDC: The reaction from some of the community was that some of the values e.g. swimming, do not always lend themselves to the N/R/L ranking, where there may be many, locally ranked sites of high significance (similar to tangata whenua values).</li> <li>• GDC: Hard to find enough experts to participate sometimes (e.g. birds, swimming) – however that is usually a reflection of the importance of the value in the region.</li> <li>• HBRC: Reductionist approach and ranking may not suit all values e.g. cultural</li> </ul>	<ul style="list-style-type: none"> <li>• May have a once over likely feel to it given that it can be applied in a relatively short time</li> <li>• Depends on getting the right ‘experts’</li> </ul>

Both the strengths and weaknesses can be the catalyst for further opportunities for RiVAS (Table 6). An obvious opportunity is in the integrated mapping area, i.e., where and how do values of importance overlap in a region and what does this mean? HBRC is perhaps most advanced in this area but there are challenges to mapping the data, e.g., how to deal with values that operate at different scales such as irrigation and swimming holes.

Table 6: Opportunities identified for RiVAS.

<b>Policy / planning</b>	<b>Other</b>
<ul style="list-style-type: none"> <li>• TDC: Very good tool to understand just what is at stake – and the kinds of trade-offs that might be required (attributes very useful for expressing this.)</li> <li>• TDC: Using the RiVAS attributes and data may give us the information we need to develop the evidential requirements for deciding what is or isn’t acknowledged at the plan level – i.e., criteria to decide what goes into the schedule in the first place.</li> <li>• GDC: Consideration of a way to factor in updated information over time e.g. native fish already has some new information. Do we keep the document ‘live’ or review it every few years for example.</li> </ul>	<ul style="list-style-type: none"> <li>• Great way to collate and present a lot of data about rivers – useful in community processes</li> <li>• Am looking forward to getting the information mapped – but can see there may be some issues – scale, reach as</li> </ul>

<ul style="list-style-type: none"> <li>• GDC: using the information to translate the freshwater values for each water body into an environmental flow so that robust and realistic allocation limits can be set.</li> <li>• HBRC: Application to catchments (rather than region) will be useful for ICM</li> </ul>	<p>opposed to point source locations are somewhat different for all the values.</p>
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Logically there are threats to RiVAS (Table 7). One aim of RiVAS was to have, ultimately, a national level application but this idea has had no tangible support from Central Government and there are risks with the slightly variable applications being undertaken – this issue needs to be addressed before many more applications are undertaken.

Table 7: Threats identified for RiVAS

<b>Policy / planning</b>
<ul style="list-style-type: none"> <li>• TDC: Slightly different interpretations with each application – may undermine eventual development of that “nationally significant” threshold.</li> <li>• TDC: Different experts disagreeing on how attributes assessed/prioritized</li> <li>• GDC: Getting buy in from some stakeholders who think it is too broad brush/overarching.</li> <li>• HBRC: Requires buy-in (experts, community, planners, councils, lawyers?)</li> </ul>

**Other comments**

Both GDC and HBRC expressed some initial misgivings with the very scientific approach taken by the RiVAS approach to native fish, whereby DoC and Cawthron Institute used the Freshwater Environments of New Zealand and other data bases as a way of populating indicator data, i.e., compared with a lot of other values, it was a lot more data rich. The concern expressed was that the data set produced was quite overwhelming and was not complementary to the expert panel! According to GDC it would have been good to have a chance at grouping the data differently as the expert panel didn’t agree with it on the day (although I note this was only for one of the attributes, namely water quality). GDC further noted that this was more of a process issue at their end though. HBRC and TDC did not experience this concern.

**RiVAS+ – an evaluation**

RiVAS+ is new with limited applications, as shown in Table 8.

Table 8: Applications of RiVAS+ in 3 regions.

<b>Policy / planning</b>	<b>Other</b>
<ul style="list-style-type: none"> <li>• TDC: not yet applied – intend to use RiVAS+ to advise not only management objectives (particularly if there are development opportunities or rivers where ‘claw backs’ are needed, but also to drive management methods and measures adopted to meet stated objectives.</li> <li>• GDC: Regional Fresh Water Management Planning – applied to 6/7 values assessed.</li> </ul>	<ul style="list-style-type: none"> <li>• TDC: expect our river management programme will also be informed by this information –how and where particular river works are carried out, public access effects of river works etc.</li> </ul>

The SWOT analysis of RiVAS+ is enlightening also, as shown in Tables 9, 10, 11 and 12. As with RiVAS key strengths of RiVAS+ include its standard and defensible method, its ability to assist with identifying research and monitoring requirements (e.g., as highlighted by swimming) and its relative cost effectiveness and ability to promote engagement between council, technical experts and lay experts.

Table 9: Strengths of RiVAS+ in a range of council applications.

<b>Policy / planning</b>
<ul style="list-style-type: none"> <li>• TDC: Will help provide a more integrated management approach that is more forward looking</li> <li>• GDC: A quick and efficient way to get people to say what they really think would work in an ideal world whilst putting cost to the side.</li> </ul>

RiVAS+ has weaknesses (Table 10). The comments around the ‘wish list’ do need to be tempered in that EP members were carefully advised to take a realistic approach to restoration.

Table 10: Weaknesses identified in RiVAS+.

<b>Policy / planning</b>	<b>Research / survey / monitoring</b>	<b>Other</b>
<ul style="list-style-type: none"> <li>• TDC: A potential “wish list” rather than well justified set of potential outcomes</li> <li>• HBRC: RiVAS+ is too cursory/rushed</li> </ul>	<ul style="list-style-type: none"> <li>• TDC: A potential “wish list” rather than well justified set of potential outcomes</li> </ul>	<ul style="list-style-type: none"> <li>• TDC: A potential “wish list” rather than well justified set of potential outcomes</li> </ul>

Both the strengths and weaknesses can be the catalyst for further opportunities for RiVAS+ (Table 11).

Table 11: Opportunities identified for RiVAS+.

<b>Policy / planning</b>	<b>Research / survey / monitoring</b>
<ul style="list-style-type: none"> <li>• TDC: Helps prioritise</li> <li>• TDC: Forward looking</li> <li>• TDC: Integrates both development and restoration opportunities – or at least recognises them both.</li> <li>• GDC: For our purposes, maybe something to be revisited further down the track.</li> <li>• HBRC: If undertaken in more detail, may be useful for informing management decisions such as which waterways could most benefit from interventions</li> </ul>	<ul style="list-style-type: none"> <li>• TDC: Can help inform and prioritise many of our works and services programmes including riparian land management strategy, esplanade reserve policy, reserve management and creation policy, river works programme, land use planning decisions (esp re any development opportunities)</li> </ul>

Logically there are threats to RiVAS+ (Table 12), although only been commented on by TDC.

Table 12: Threats identified for RiVAS+.

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<b>Policy / planning</b>
• TDC: Need to keep information up to date and respond to new information – implies that it will be organic and develop further over time.

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## **Discussion, Insights and Conclusions**

The application of a standardised MCA approach to the prioritisation of different values across a range of rivers (RiVAS) has been hugely successful. Of the 11 in- and out-of-stream values that RiVAS has been applied to, seven have had multiple applications, mostly within three host councils. All three councils have been enormously supportive of RiVAS (and to a lesser extent RiVAS+) and continue to develop its use in a host of ways never envisaged when the tool was first developed. Given the highly cost effective nature of RiVAS and RiVAS+ its future seems assured, or does it?

Certainly, RiVAS seems an obvious tool for resource strapped smaller regional or unitary councils to implement. They are delivered a tool which is cost effective to implement, engaging of a wide range of stakeholders, uses the best available information, delivers a wide range of outputs, and contributes to a range of policy/planning and research/monitoring initiatives.

These positive conclusions would seem to assure the continued use of RiVAS (and perhaps also RiVAS+). But there are challenges. Notable amongst these challenges is the need for host councils to deliberate (more) carefully over the selection of expert panels – a few of the existing applications have been jeopardised by ‘probably’ inappropriate appointments.

Perhaps most challenging however is the need to consider how RiVAS (and to an extent RiVAS+) might contribute to national level policy thinking around relative ‘importance’, if importance matters. It appears obvious that with further development RiVAS can be used as a tool in thinking about trade offs. But, with hydro energy a matter of national importance it can be argued all rivers are of national importance for hydro. This, however, is naïve, as clearly shown by Meridian Energy Ltd’s recent withdrawal from its proposed Mokihinui development. RiVAS work showed the Mokihinui of national importance for whitewater kayaking and no more than of regional for energy generation – this without all the other ‘outstanding’ biophysical characteristics of the river. So, all rivers may be nationally important within a policy setting but clearly some are more important than others for some values. Clearly, the Ministry could provide some policy direction in this area, including for RiVAS development and use.

In terms of RiVAS+, there seems little doubt it too has utility, but perhaps not in the same direction as initially envisaged. Rather, it acts as a complement to RiVAS, especially for instream values, and provides a ‘heads up’ on management actions that are most likely to positively change a value’s score, e.g., native fish on many rivers could be enhanced by the fencing off of inanga spawning habitat, while the value of swimming holes can be easily enhanced by the improvement of access and sometimes by the addition of facilities.

Whether RiVAS and RiVAS+ gain more traction is now in the hands of councils and to a lesser extent, consultants and others. But, given the level of support obvious from the results



of the council evaluation reported here, it would be surprising, in these resource constrained and information short times, if both tools were not much more widely used in the near future.

## **References**

- Hughey K.F.D. and Baker M-A, eds. (2010). The River Values Assessment System (Vols. 1 & 2). Land Environment and People Research Reports 24A & 24B. Lincoln University, LE&P Research Centre.
- Hughey, K.F.D. and Baker, M-A. (eds). (2010a). Overview of the Method, Guidelines for Use and Application to Recreational Values. Pp.43-64 in Hughey KFD, Baker M-A, eds. 2010. LEaP Report No.24A, Lincoln University, New Zealand.
- Hughey, K.F.D. and Booth, K.L. (In press). Monitoring the state of New Zealand rivers: How the River Values Assessment System can help. NZ J. Mar. Freshw. Res.