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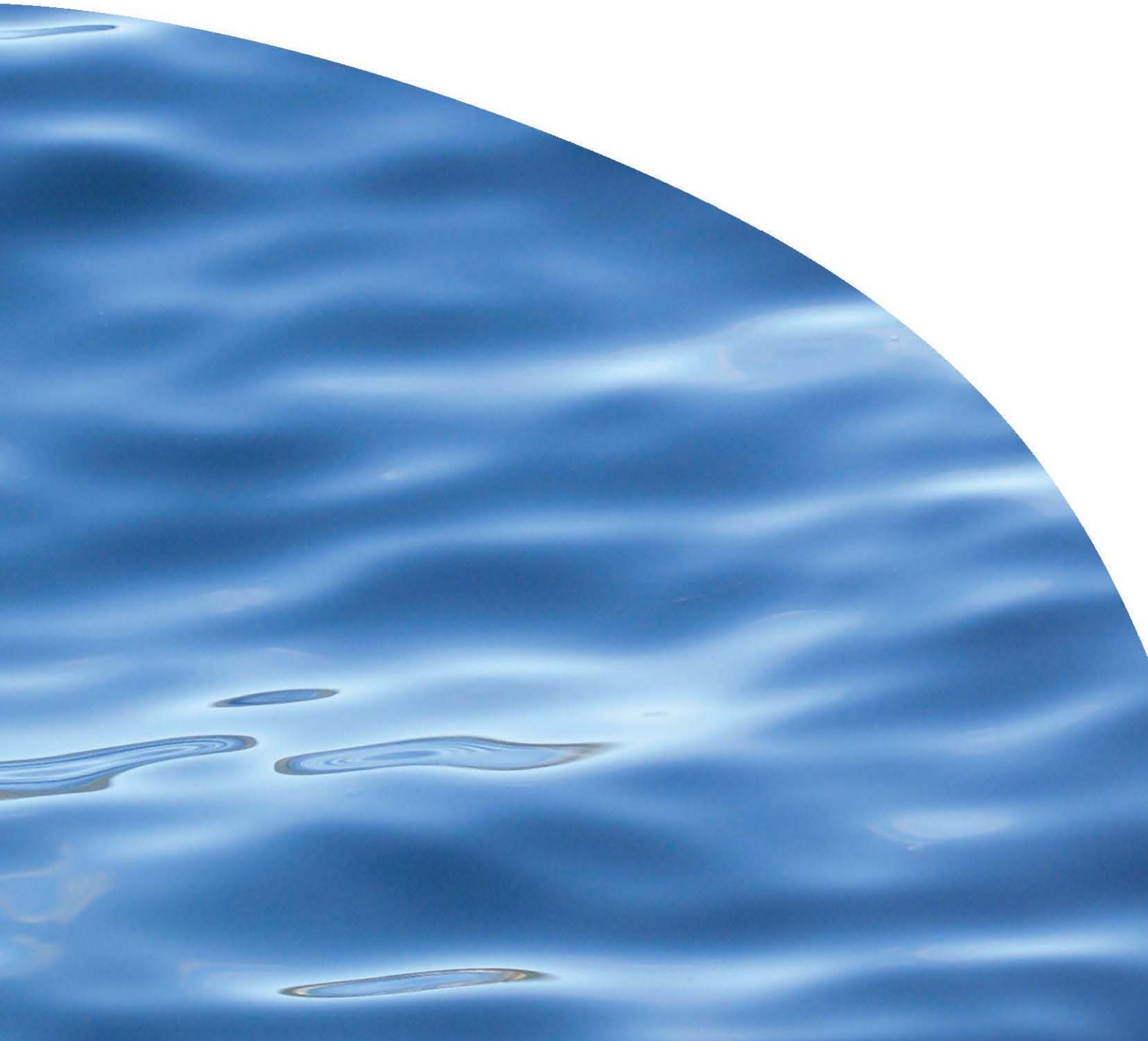

VALUING OUR WATERS - A CASE STUDY IN TASMAN DISTRICT

JIM SINNER, ANDREW FENEMOR, MARGARET KILVINGTON, WILL ALLEN, MARC TADAKI, MARY-ANNE BAKER

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CAWTHRON INSTITUTE
98 Halifax Street East Nelson 7010 | Private Bag 2 Nelson 7042 | New Zealand
Ph. +64 3 548 2319 | Fax. + 64 3 546 9464
www.cawthron.org.nz

REVIEWED BY:
Chris Batstone

APPROVED FOR RELEASE BY:
Rowan Strickland

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EXECUTIVE SUMMARY

Research objectives

The National Policy Statement on Freshwater Management directs regional councils to set objectives and limits for the management of all freshwater bodies in New Zealand, based on community values.

This case study, part of a wider research project called Freshwater Values, Monitoring and Outcomes, had three main objectives -

1. To explore the language of values and develop a common terminology for discussing how values should be provided for in regional plans.
2. To test ways of assessing the significance of particular uses and values, *e.g.* using the River Value Assessment System (RiVAS) and to a lesser extent, choice modelling (CM), as tools to inform priority-setting by regional councils
3. To see whether, through a process of shared learning, stakeholder experts could develop an example of how to 'balance' and provide for diverse and sometimes competing values in a regional plan.

A trans-disciplinary research team investigated these objectives through an action research project, Valuing Our Waters (VOW), in conjunction with Tasman District Council (TDC). This involved five workshops with 20 invited stakeholder experts from diverse backgrounds and an online CM survey of local residents. The six members of the research team, through numerous and robust discussions, refined and revised the research questions and objectives as we learned from the stakeholders and from each other.

Identifying and assessing values

People find many different meanings in and through their interactions with freshwater systems, and the logic used to categorise these interactions can have implications for freshwater management. Even the language of values is diverse – what one person describes as a value another person might define as an activity, a belief or a source of value.

Despite this, it was evident from the workshops that stakeholders can have fruitful discussions about freshwater values even when they use values terminology differently, because people can usually tell from the context what someone else means when talking about a 'freshwater value'. There was acceptance that freshwater planning is concerned with 'things (uses and values) that have value', and there was no need to seek consensus from participants on definitions of these terms.

Tools such as RiVAS identify and assess values by defining freshwater uses and values into categories so they can be measured and assessed according to a limited number of attributes. This has implications for how objectives are defined, how targets are set and how

progress is measured, and tends to promote uses and values that can be measured (*e.g.* using RiVAS) over more holistic perspectives on the value of freshwater, *e.g.* such as Māori kaitiakitanga (guardianship).

RiVAS can be useful for getting a sense of how 'attributes that matter' are distributed across rivers in the region, which can provide a basis for both developing objectives and monitoring their achievement. But this must be done in a way that recognises that values are constructed and context-dependent, influenced by the metrics and functions we use to describe them. Further, such tools which provide the language and metrics of values, must be developed and used within wider processes that empower people who see the world differently to voice their concerns and aspirations.

An online CM survey was used to evaluate preferences of local residents for different possible states of three Tasman rivers; the Matakitaki, Takaka and Waimea Rivers. This also required uses and values of rivers to be described in terms of a limited number of attributes. We concluded that CM is most likely to be useful for assessing well-defined alternative scenarios for a given landscape, system or resource, rather than making comparisons across three rivers to identify regional freshwater objectives. As with RiVAS, attributes for CM studies should be developed in conjunction with interested stakeholders.

Vision statements as a means of expressing freshwater values

The VOW workshops discussed how to assess the 'significance' of particular uses or values and the tension between managing for defined categories of value (*e.g.* irrigation, kayaking) vs. more holistic perspectives. In response to these challenges, participants suggested developing a vision statement for each catchment, to guide the development of more measurable policy and rules. A vision statement paints a picture of a future state and the process of its human and environmental development, as well as its limits. The process of visioning could provide creative opportunities for people to express the many and diverse ways that rivers, lakes, streams, wetlands and aquifers matter, as well as their views regarding change.

To address issues of scale and cumulative effects, we recommend working with communities of interest around large catchments or clusters of catchments. In each community, a process would include both visioning and a more detailed discussion (assisted by, but not driven by, tools such as RiVAS) about management objectives and development paths that are likely to provide for a suite of uses and values.

In Tasman District, for instance, this would suggest possibly three such processes: one each for Golden Bay, the Tasman Bay Plains, and the Murchison area. Collectively these cover the seven catchment clusters in the District: (1) Takaka, Abel Tasman, Aorere and West Coast, (2) Motueka, Moutere, Waimea and (3) Upper Buller.

Integrated planning for freshwater values

Conversations and decisions about managing freshwater systems need to also recognise their fundamental dependence on land use and their connections with coastal environments. To achieve this integrated planning, we recommend that regional plan provisions such as schedules of freshwater uses and values be linked to objectives, policies and methods not just for water allocation and water quality, but also for land use, activities on the beds and banks of water bodies, and the coastal environment. For each major catchment or community of interest, these provisions would be guided by an overarching vision statement.

To be of practical relevance, a longer-term vision statement needs to be given effect through a set of shorter-term objectives and measurable targets that have management relevance at various levels. These 'thresholds of concerns' would be modified and adapted as understanding increases.

This research found there are no guaranteed recipes for identifying, assessing and balancing diverse uses and values of freshwater systems. Experts can help stakeholders and decision-makers to understand complex systems and even predict what might happen under certain scenarios and estimate likely costs and benefits, but they cannot provide the 'right answer' as to which scenario to pursue.

By using both vision statements of catchment futures and tools that focus on specific categories of uses and values, and understanding both the potential and limitations of these approaches, communities can perhaps better accommodate the diverse values of freshwaters in their planning decisions. A process of adaptive management can then be used to review and revise the vision statement, management objectives and targets as each community learns more and as social and ecological systems evolve over time.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1. THE CHALLENGE: ACCOMMODATING FRESHWATER VALUES IN DECISION-MAKING

1.1. Water management is a contest of values

New Zealanders over the past twenty years have begun to voice increasing concern about the pressures on our water resources. The effects of these pressures are seen in widespread declines in the water quality and ecological health of lowland streams, lakes and aquifers. The effects of extracting water are similarly seen in the limited water available in some catchments, and those pressures consequentially impact upon other uses (*e.g.* recreation) and values (*e.g.* amenity) of those water bodies.

The NZ Government has stated that "Outcomes will only be achieved by considering and making trade-offs between values, within a decision-making framework that sets limits and bottom lines"[1]. But for any particular water body, what are those values? What weight should be given to each value when making trade-offs? And what decision-making processes for making those trade-offs would deliver the best outcomes for society, considering the economic, environmental, social and cultural consequences?

This report describes and draws conclusions from an action research project which addressed those questions in five stakeholder workshops in Tasman District. Given that achieving sustainable land and water management is fundamentally a contest of values (Fenemor *et al.*, 2011), we need better ways to elicit, describe, compare and accommodate values in Resource Management Act (RMA) policy and consents. The research uses a case study approach in which the stakeholder discussions are grounded in the context of decision-making under the Tasman Resource Management Plan (TRMP) of the Tasman District Council (TDC).

In the remainder of this introduction, we summarise the current approach for managing freshwater under the RMA and the more detailed drivers and hypotheses for this research. The report is then structured as follows:

- Section 2 explores the concepts of value and values and what we learned about how people understand these.
- Section 3 summarises the recruitment of participants and the design of the Tasman workshops.
- Section 4 describes the workshops.

[1] From NZ Government Cabinet paper June 2009 accessed at http://www.mfe.govt.nz/issues/water/freshwater/new-start-for-fresh-water-paper.html

- Section 5 considers three approaches to elicit, describe, compare and/or accommodate values that were explored during the course of the workshops.
- Section 6 presents the team's conclusions about how TDC might improve its decision-making by better incorporating information about freshwater values in the TRMP.
- Section 7 synthesises the conclusions in the wider context of water management across New Zealand and includes observations about further research that could support improved decision-making concerning freshwater values.

1.2. Fresh water management in focus

Responsibility for freshwater policy and management is shared across local, regional and central government in New Zealand, governed mainly by the Resource Management Act 1991 (RMA). Central government has the responsibility for setting policy at a national level, through RMA instruments such as national policy statements, national environmental standards and regulations, as well as by funding research and advice on good planning practice.

The eleven regional councils have direct operational responsibility for freshwater management, including setting objectives, policies, rules and methods, including for stream flow and groundwater levels, flood control, water quality and habitat quality. Regional council functions include the control of land use for the purpose of managing water quality, quantity and ecosystems. District and city (*i.e.* local) councils have responsibility for infrastructure and for land use policy and must give effect to Regional Policy statements prepared by Regional Councils. New Zealand has five unitary local authorities, which combine the functions and responsibilities of both regional and district councils. Tasman District Council is one of these unitary authorities.

Freshwater management has been a major focus of environmental policy in New Zealand since at least 2000 (Ministry for the Environment, 2000). In 2003 the government launched a programme of action for sustainable development (New Zealand Government, 2003) with freshwater quality and allocation as one of the government's top five priorities. The programme gave further impetus to work already underway to address concerns that "in some areas, demand cannot be met at some times of the year" and "the quality of many lowland streams, lakes, groundwaters and wetlands in areas of intensive land use continues to fall below acceptable standards" (*ibid.*, pp.13-14). A wide-ranging programme of work has continued since then, with a number of reports and policy proposals being considered[2].

[2] See *e.g.* http://www.mfe.govt.nz/issues/water/prog-action/ and http://www.mfe.govt.nz/issues/water/freshwater/new-start-fresh-water.html.

Since its enactment in 1991, the RMA has been interpreted by practitioners and interested parties as focusing on addressing adverse environmental effects of activities rather than specifying what activities were allowed (Ministry for the Environment, 1994; Upton, 1996). Accordingly the task of local authorities responsible for freshwater management was to translate the generic, qualitative 'bottom lines' described in the RMA (*e.g.* "safeguarding the life-supporting capacity of air, water, soil and ecosystems") into quantitative, management-relevant policies and rules.

From here it is but a short journey to an enquiry into values, as highlighted by the statement (cited above) that outcomes will only be achieved by considering and making trade-offs between values. This enquiry into values therefore includes how to better strike a balance between incompatible aspirations, *e.g.* for some developments *vs.* maintenance of instream ecological values, and how councils should choose, and justify their choices, between competing options *e.g.*, water storage, water extraction, intensified land use, instream activities and freshwater fisheries.

Because freshwater management decisions are frequently appealed to the Environment Court, regional councils continue to seek more technically robust, legally defensible approaches to assess values as a basis upon which to specify quantitative standards and limits.

As described above, the need for improved freshwater management frameworks has been recognised by central government for several years. In 2008, one of the final acts of the out-going Government was to propose a National Policy Statement (NPS) on Freshwater Management[3]. The incoming Government later received a recommendation from a Board of Inquiry for a substantially changed NPS, and referred this to the Land and Water Forum (LAWF)[4]. After the LAWF submitted its report and conducted a further round of public meetings, the Government made changes to the Board of Inquiry recommendations and released the final NPS on Freshwater Management in May 2011.

As stated in its Preamble, the final NPS aims to "direct local government to manage water in an integrated and sustainable way, while providing for economic growth within set water quantity and quality limits" (New Zealand Government, 2011).

[3] In 2008, the previous government also released a proposed national environmental standard for setting in-stream flows and levels to protect aquatic ecosystems, including default values for water bodies for which regional councils have not set them. Public submissions were received on the proposal, but it has been on hold since the change of government in 2008 and its future remains uncertain.

[4] The Government set up the Land and Water Forum in 2009 as an experiment in collaborative governance and asked the forum to identify shared outcomes and goals for freshwater and related land management, and identify options and long-term strategies to achieve these outcomes and goals for freshwater. See http://www.landandwater.org.nz/.

The NPS on Freshwater Management refers to the diverse values associated with freshwater systems in New Zealand and recognises the need for clear objectives and limits:

> *Setting enforceable quality and quantity limits is a key purpose of this national policy statement. This is a fundamental step to achieving environmental outcomes and creating the necessary incentives to use fresh water efficiently, while providing certainty for investment (New Zealand Government, 2011).*

The NPS directs councils to set objectives and catchment-wide limits for abstractions and discharges for all freshwater bodies in their respective regions by 2030. Councils must also implement methods to address over-allocation and to ensure limits are achieved.

The government also issued an NPS on Renewable Electricity Generation in 2011. This NPS directs RMA decision-makers to "recognise and provide for the national significance of renewable electricity generation activities". It directs councils to provide for these activities where applicable within their regions by making any necessary changes to their policies and plans by mid-2013. It does not, however, require that councils give priority to hydro-electric power generation over other uses, leaving that for councils to decide in light of the two NPSs and the RMA more generally.

New Zealand's water policy problem in many cases manifests itself as reactive policy responses to remedy or mitigate impacts that have resulted from insufficient consideration of the value (and values) of healthy water bodies or, at least, insufficient attention given to establishing robust planning frameworks for their protection. Government has, through the NPS for Freshwater Management, directed councils to be more proactive in setting limits and redressing over-allocation, but has refrained from setting limits at a national level. This means regional councils still face the challenge of identifying, assessing and managing for diverse values.

Put another way, the issue is one of understanding thresholds and limits and how these can be developed to constrain or manage cumulative effects of activities. The nature and significance of the effects of some activities have taken time to understand fully in some complex systems, especially the temporal and spatial connections between land and water, as have the diverse ways in which people and communities value freshwater systems.

The difficulty in identifying and assessing values and establishing limits has resulted in policies and frameworks that are not effective for managing the cumulative effects of activities, especially where activities are individually minor with negligible adverse effects on the environment (Office of the Auditor General, 2011). Fish and Game New Zealand has dubbed this the "salami syndrome" – "slicing off a little bit more of what then becomes less and less" (Johnson, 2009). Examples include water takes from

rivers and aquifers for irrigating pasture, and runoff of sediment and nutrients from cultivated land.

The difficulty in providing clear and enforceable limits on cumulative effects has resulted in significant costs for central and local government to address impacts on several freshwater systems. Examples of current government funding for restoration efforts include[5]:

- Lake Taupo Protection Trust ($81.5 million, 2007-2018)
- Waikato River settlement ($210m, 2010-2040)
- Rotorua Lakes ($144m, 2008-2018)
- TeWaihora Lake Ellesmere ($11.6m, 2012-2014)
- Manawatu River, Wainono Lagoon, Wairarapa Moana
- Waituna Lagoon ($8m, 2012-2014).

The government funding for these clean-up efforts is a clear indication that the degraded state of the water bodies is unacceptable, *i.e.* that their value and values have been given insufficient protection.

Planning practice is still evolving on how councils can most effectively establish limits to manage cumulative effects and incorporate these into regional plans. TDC has sought to address this issue through its regional plan, the TRMP, by identifying the uses and values of freshwater in various catchments and using these to guide the setting of limits on water abstraction, including default values where specific limits have not been set. The TRMP also requires applicants for other river disturbance activities to consider their potential impacts on these values. TDC has yet to complete work that establishes water quality limits or standards based on these values, but the TRMP provides some default limits while this work is done.

1.3. Freshwater management research

1.3.1. New Zealand research priorities

In 2009 a Freshwater Research Strategy was produced by the Foundation for Research Science and Technology, the government's main research funding body[6], in conjunction with the Ministry for the Environment. The strategy stated:

[5] Figures for Taupo and Rotorua Lakes and the Waikato River are from a Cabinet paper "Assistance Fund for Freshwater Clean-ups", 8 March 2011. Other figures are from the Ministry for the Environment website: http://www.mfe.govt.nz/issues/water/freshwater/fresh-start-for-fresh-water/cleanup-fund.html.

[6] In 2011, the Foundation for Research Science and Technology merged with the Ministry of Research Science and Technology to create the Ministry of Science and Innovation (MSI). In 2012, MSI will become part of a new Ministry of Business, Innovation and Employment.

> *Decision making processes also need to evaluate and balance the multitude of values associated with water, recognising the values may relate to social, cultural, environmental, economic and/or ecosystem services. At times these values will be in conflict and may vary with time, flow and quality of the water body (FoRST/MfE, 2009).*

Research needs were further elaborated, including the excerpt shown in Figure 1. In line with these priorities, the Freshwater Values Monitoring and Outcomes (FVMO) research programme began in 2010. This three-year programme led by Landcare Research aims to develop tools to improve freshwater decision-making by better assessment of diverse values, enhanced ability to choose effective policies, and improved monitoring and reporting against agreed outcomes. A further strand of research involves working with iwi on approaches to achieve better recognition of Māori values in freshwater management.

Key area	Subsection	Research needs
Understanding, valuing and managing water resources, including life supporting capacity of aquatic systems	Valuing and managing the resources	• Methods to describe, understand and, where appropriate, quantify, compare and weigh up the economic, social, environmental, cultural and ecosystem services values of urban and rural fresh water, and application of these methods across all of New Zealand. • Development of processes to balance economic, social, cultural, environmental and ecosystem services values to achieve the optimal outcomes at all scales. • Methods to relate how decision-making leads to changes in the physical, chemical and biological characteristics of water and impacts on the resource value.

Figure 1. Excerpt from freshwater research needs identified by the Foundation of Research, Science and Technology and the Ministry for the Environment. Source: FoRST/MFE, 2009, pp. 9-10. Emphasis added.

Within this programme, Cawthron Institute (Cawthron) leads a work stream on identifying, assessing and balancing values for freshwater management.
For the research on values, Cawthron and Landcare Research partnered with TDC, a unitary authority, on an action-research case study designed to explore how people express values for freshwater, and how these expressions of value can be usefully translated into policy and planning mechanisms to aid decision-making about freshwater management.

As with all action research, this project was situated in a particular context. In support of a schedule of uses and values in its TRMP, TDC was actively involved in the

development of the RiVAS methodology[7] to assess the significance of rivers for a range of uses and values. The terms of reference for the FVMO project, of which this Tasman case study is a part, called for an investigation of how the RiVAS methodology could best support decision-making by regional councils. The terms of reference also indicated that an economics methodology known as choice modelling (see Section 5.3) would be tested for its possible contribution to the problem of balancing diverse freshwater values.

In particular the case study focussed on Schedule 30[8] of the TRMP, a list of significant freshwater uses and values that TDC acknowledges is incomplete. (An excerpt of Schedule 30 is provided in Appendix 1.) Using the case study to guide further development of Schedule 30 – both in terms of a more comprehensive coverage of values and improved qualification of these values – was endorsed by freshwater stakeholders at a meeting in early 2011. The aim was to provide advice about development of a better framework to guide TDC's decisions on such matters as standards and limits for flow regimes, water quality standards, resource consent applications, targeted research projects, enhancement projects or future plan changes. Any changes to improve the TRMP's Schedule 30 would be made through a future plan change.

The case study itself involved a progressive series of five workshops with 20 invited stakeholders from a range of backgrounds. Between workshops the project team reflected on the outcomes and adjusted the design for following workshop.

The case study objectives also included reviewing the utility of freshwater decision-support tools such as the RiVAS (Hughey *et al.* 2010) and CM as a means of providing more detail for decision-makers on significant values of freshwater bodies, and the preferences of stakeholders for particular values.

A full outline of the case study approach is provided in Section 3.

1.3.2. Research hypotheses and expectations

Action research comprises a family of research methodologies which aim to pursue action and research outcomes at the same time. It therefore has some components which resemble consultancy or change agency, and some which resemble field research (Allen, 2001; Huang, 2010). The focus is action to improve a situation, while the research is the conscious effort, as part of the process, to formulate public knowledge that adds to theories of action that promote or inhibit learning in behavioural systems. One of the key characteristics of this approach is collaboration,

[7] RiVAS is the River Values Assessment System, discussed more fully in Section 5.1.
[8] The Schedule has previously been numbered as Schedule 30.1 and in the TRMP's current version, it is Schedule 30A. For simplicity, it is referred to as Schedule 30 in this report.

which enables mutual understanding and consensus, democratic decision-making and common action. The underpinning philosophy is that dialogue is necessary to bring in different perspectives and work collaboratively.

In keeping with this approach, there was an underlying 'action' theme of helping TDC to improve its own freshwater planning through improvements to Schedule 30. Appeals had been lodged on initial proposed changes to Schedule 30, and the appellants agreed that this research process be pursued prior to further changes being made to Schedule 30.

This case study is of interest not just for TDC and Tasman stakeholders but for all regional councils in New Zealand and possibly beyond. As a TDC manager put it, the council wanted to know:

- What constitutes a valid or significant value? How significant does a use or value have to be for it to be formally acknowledged in a statutory plan?
- How can the significance of values best be assessed, *i.e.* how does a council determine how important a particular value is? How can 'nationally significant' and 'regionally significant' be defined and determined?
- How does a council decide between competing values and hence determine objectives and priorities, for a given water body or across multiple water bodies?

The main research questions and hypotheses concerning the development and application of such a schedule of values can be summarised as follows:

- What is a useful terminology to bridge the different meanings that people have around values? People use the terms 'value', 'values' and 'uses' to mean different things. Is a common terminology necessary to have a constructive dialogue about how values can and should be considered in freshwater decision-making?
- What information do people need to discuss priorities? With more information on significant uses and values of Tasman rivers, stakeholders would be better positioned to discuss the priorities to give to different freshwater bodies and to identify where and how to accommodate diverse and sometimes competing uses and values.
- Do tools such as RiVAS and CM support people in assessing significance? Choice modelling, a methodology from economics, can provide estimates of the relative value of different activities on the same river, whereas RiVAS assesses the same activity (i.e. use or value) on different rivers, so can CM be used to 'cross-calibrate' and enhance the usefulness of the RiVAS results?
- Are there certain potentially significant values that get left out of current decision-making – particularly acknowledging the need to address cultural perspectives

and cumulative effects? Are there some uses and values that, if provided for, will to a large extent ensure that a range of others are also provided for?

- Are there more holistic approaches to policy development and decision-making that can link these different elements around values?
- Are there particular social approaches and processes that provide the foundation for stakeholders to work more constructively with the above tools and questions?

1.4. The research team

The research team for this case study comprised six people, selected to provide a range of perspectives on freshwater management including experience in disciplines relating to hydrology, natural resource management, economics, participation and policy. This diversity of viewpoints within the project team led to some rich discussions on the concept of values and valuing.

The case study was led by **Jim Sinner**, who trained in economics and political science. He has spent 25 years working at the interface of environmental science and policy in government, as a private consultant, in an environmental organisation and since 2007 at Cawthron, a community-owned research institute. Jim set the overall objectives of the study based on the wider research Freshwater Values, Monitoring and Outcomes research programme and convened team meetings to de-brief after each workshop and plan the next one.

Andrew Fenemor is a hydrologist and water management researcher at Landcare Research in Nelson. From 2002-2011, he led the Integrated Catchment Management (ICM) research programme based in the Motueka catchment.[9] Prior to that, he was environmental manager at TDC. His research interests are at the interfaces between catchment science, policy and action. Andrew brought to the project his technical understanding of the catchments of Tasman District and involvement in water management policy pre- and post-RMA.

Margaret Kilvington is an independent consultant, who has worked within the environmental management and research sector for the past 20 years. Her original background is in ecology and natural resource management, and she has spent the last 15 years developing a primary interest in theory and praxis of collaboration, social learning and complex problem solving in the environmental management context. Margaret was brought into the team to help design and facilitate the case study workshops. She was funded jointly by the TDC and the research project in recognition that her role was to consider the needs of both partners in the case study.

[9] See http://icm.landcareresearch.co.nz/

Will Allen is a researcher who specialises in participatory action research and systems science. Between 1993 and 2009, Will worked for Landcare Research and now works independently. In recent years he has been involved in developing approaches that link institutional and technical activities with longer-term environmental and social outcomes using a wide range of evaluation methodologies and methods, including outcomes modelling. He also manages the Learning for Sustainability (LfS) portal, http://learningforsustainability.net.

Marc Tadaki is a geographer with a broad interest in how humans conceptualise and interact with environmental systems. He has had previous exposure to non-market environmental valuation practices and conceptual frameworks underpinning ecosystem services and environmental values. His background in critical political ecology bolstered his interest in and concern with the use of reductionist tools in planning. Marc was enrolled into the project as a critical observer, participant and member of the research team. The project acted as a Masters project for Marc's exploration of "freshwater values in the making", and his thesis (Tadaki, 2012) stands as a parallel and complementary account of the Valuing Our Waters experience.

Mary-Anne Baker is a policy planner with the Tasman District Council (TDC). She has been involved in development of water policy and planning for the Council and in national forums for nearly 20 years. She has a particular interest in water allocation and the management of contaminant discharges. Mary-Anne helped to frame the research project and participated in most meetings of the project team. Her pragmatic observations were invaluable in helping us to keep the project relevant to current challenges in freshwater management in New Zealand.

2. VALUES AND CONCEPTS OF VALUE

2.1. Values and ways that matter

Freshwater means many things to many different people. In many policy documents, freshwater is described as a critical resource for economic development, as well as for social, cultural and ecological objectives, which needs to be optimally allocated across competing end uses (*e.g.* FRST/MfE, 2009, p.10). From another perspective, access to clean water and waterways has been described as a right, something which cannot be balanced between competing practices. In these and many other instances, what we think is desirable as an outcome of environmental management, and ultimately what we think is fair, is shaped by the ways in which we derive meaning from freshwater.

The primary policy context for considering freshwater values comes from the Resource Management Act (RMA) and the recent National Policy Statement (NPS) on Freshwater Management (Ministry for the Environment, 2011). While the RMA does not use values terminology *per se* in referring to matters of national importance, the term 'value' (including 'values' and 'valued') occurs in the NPS no less than 24 times, 17 in the Preamble and a further seven times in the main text. The NPS requires that regional authorities "provide for the values that are important to New Zealanders", and lists a series of uses for and meanings derived from water. These include drinking water, electricity generation, food production, Māori relationships with water, and sense-of-place in communities. Further, the NPS instructs authorities to set water quality and quantity limits that "reflect local and national values" (*ibid*.).

From these documents we observe a tension inherent in the ways that values are discussed. Are values something that can be quantified on a standardised scale and 'balanced', or are they fundamentally incomparable, or can some be balanced but others are 'bottom line' requirements? When discussing values, there is a need for conceptual clarity that extends beyond mere terminology.

For the purposes of this report, we can think of values in at least four ways.

1. **Values as a comparative magnitude of preference:** How much do children value swimming in their local stream? How much would residents be willing to pay to restore the Waimea River? This concept refers to an abstract magnitude that is comparable across individuals, and might be as simple as 'a great deal' and 'not at all' or quantified in monetary terms. If the same units are chosen, and especially if they are quantitative, then decisions can seek to maximise or 'optimise' the sum of individual preferences. Economic theory, however, cautions against assuming that a dollar has equal utility for all people (Sinner *et al.*, 2005).

2. **Value as contribution to a goal**: This concept refers to how much a particular environmental situation contributes to a predefined goal or activity. For example, what is the swimming value of the Waimea River, or the natural character value of the Matakitaki River? Other examples could include fish or bird abundance or diversity, irrigation and food production value. If one utilises a quantitative magnitude, it is only comparable with other measures of the same value. For example, a river might have enough water to irrigate 4000 hectares, which is one way of expressing its value for irrigation, but that metric is not meaningful for assessing the same river's contribution to bird abundance.
3. **Values as evaluative norms and structures**: These are cognitive and moral guidelines that help us decide what is desirable and undesirable, fair and unfair. Conservative values, green values, egalitarian values: these are some of the ways in which we make sense of what is a good or bad decision. For example, the Māori value of utuutu has been described as an ethic of reciprocity; what you take from the environment you return in kind (James, 1993).
4. **Values as ways that matter**: Values are ways that we relate to our environment. 'Home', for instance, reflects a bundle of ways in which a particular environment matters to someone. For Māori, one's tūrangawaewae is the place where one feels empowered and connected to one's ancestors; one's home, foundation, and place in the world.[10] Emphasis here is on the meaning itself, as an association between a particular person and a particular environment, rather than abstracting to a magnitude, contribution or normative guideline.

While these are only four ways of understanding values in freshwater management, they are useful in helping to understand the views expressed in the VOW workshops, particularly by clarifying the various functions of tools and approaches like RiVAS, visions and CM, as each of these describes 'values' in a different way. The concept of 'ways that matter' highlights that, in policy contexts, calls to engage with diverse values can be interpreted as a desire to approach freshwater meanings as multiple and pluralist.

However, documenting, understanding and providing for certain ways that matter has proven challenging. Many researchers and practitioners have sought to simplify the values landscape by creating a range of categories. A few such categorisations are:

- Four well-beings: Economic, social, environmental and cultural
- Total economic value, consisting of: direct and indirect use value, non-use value, option value, and intrinsic value (Figure 2)
- Ecosystem services: Provisioning, regulating, supporting and cultural services.

[10] http://www.teara.govt.nz/en/papatuanuku-the-land/5

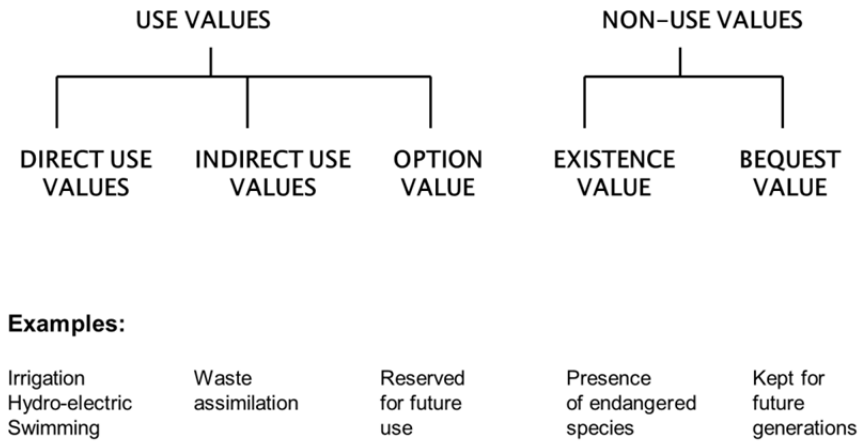

Figure 2 An economic categorisation of values.

While many of these categorisations are presented as providing distinct categories, *i.e.* any given use or value belongs in one and only one category, in practice the categories are often indistinct and over-lapping. Definitions of cultural values, or cultural services, of an ecosystem are particularly complex. These complexities arise from the fact that cultural interactions with the environment, such as mahinga kai (food gathering), are also economic and/or social interactions (Chan *et al.*, 2012). Cultural values (cultural well-being) are therefore a subset of social values or well-being, not a separate category.

The lack of distinct and unique categories of values is a problem if one is attempting to account for all aspects of value and needs to avoid double-counting (Pascual *et al.*, 2010)[11]. In many practical applications, however, the aim is more to recognise aspects of value that might otherwise be over-looked, in which case indistinct categories are not necessarily a problem. Similarly, when designing policy or a monitoring programme, categories can serve as a means of identifying features or attributes that require attention in order to protect or provide for the uses and values prioritised by the community. In this respect, categories can be defined pragmatically, although these definitions will have implications for freshwater management, as discussed in the next section.

2.2. Governing for freshwater values

The task of freshwater management for councils and other organisations in Tasman, New Zealand and the world over, can be stated simply: the ways in which freshwater matters to members of the community need to be fairly and effectively understood,

[11]Practitioners seeking clear definitions of ecosystem services, benefits and values should see Chan *et al.*(2012).

and the will of communities regarding future states of freshwater enacted through policy and/or other forms of collective action.
While simple to state, the task is complex and difficult, not least because:

1. Councils have limited resources and tools with which to engage communities.
2. Communities of interest are often defined by legal and organisational boundaries but these may not be the units most relevant to people.
3. People's understanding of, and capacity to contribute to, formal processes is highly variable, which results in stakeholders involved in council processes being self-selecting and not necessarily representative of the community.
4. Local and national values and interests may be starkly opposed, turning representation into negotiation or even confrontation.

Schedule 30 of the Tasman Resource Management Plan (TRMP), the River Values Assessment System (RiVAS), choice modelling (CM), and sector-based workshops are all ways that TDC and others have tried to represent the ways that water bodies matter to the community (see Section 5). Schedule 30 lists 'uses and values' for each river in Tasman District and RiVAS attempts to rate the relative contribution-toward-a-use of all Tasman's rivers. In these exercises, coarse 'ways that matter' are grouped into themes (*i.e.* uses or values) such as swimming or native fish, and within each theme, rivers are rated according to an expert-derived function of measured and inferred attributes that contribute to that value.

Practices that lump the 'ways that water bodies matter' into categories for the purposes of assessment and planning highlight a key concern and tension in working with values in research and policy: to what extent can or should these relationships be considered and made to be the same, and to what extent might they be different? Is swimming a suitable category for use, or are there important differences between family, social or residential swimming? While simplification through categorisation is arguably a necessary practical step in planning for catchment communities, there is also the question of what these categories mean and how they are represented.

Reductionism is another concern with work on freshwater values. Reductionism is an approach to understanding complex things by reducing them to the interactions of their parts, often by simplifying or reducing descriptions to facilitate understanding. It is often contrasted with holism, which asserts that complex things can only be understood as a whole, and not as the sum of the parts.

In many ways, some reductionism is inevitable for resource management – the world is infinitely complex, and simplification is necessary to make effective use of scarce resources for research and management. However, careful thought is needed into the how and why of reductionist approaches, because they can affect the material wellbeing of human and non-human life.

One of the enduring tensions with indicators and ecological valuation is that between reductionism and holism and, by extension, quantitative versus qualitative approaches to environmental values. Is the 'value' of a river more than the sum of its parts? Do the parts (including people) interact in ways that make things more or less meaningful than might be estimated in the abstract? Is a quantifiable estimate based on inferred preferences fair and effective enough for planning purposes?

A number of challenges can be seen in applying economic-based valuation methods to more community-based or aboriginal perspectives (Adamowicz *et al.* 1998; Phipps *et al.* 2011). Reductionist approaches to values can undercut and systematically ignore those kinds of meanings that cannot be measured and made the same. A geographer, Sue Jackson (2006), famously observed that in Australian water policy, indigenous or 'cultural' values were 'compartmentalised' by the creation of a new separate category in planning documents, but because these meanings were not quantifiable or comparable to economic metrics they have been, and continue to be, ignored in practice (see also Gibbs, 2010).

These issues are not unique to indigenous groups, but rather highlight that some freshwater meanings are more readily (or compellingly) quantifiable and measurable than others, and these attributes can combine with particular narratives of planning practice to promote certain values over others. It is not that the values and worldviews are deliberately ignored or under-valued, but in many cases that planners and policy makers do not know how to provide for values that are not expressed in terms of measurable objectives and indicators.

Approaches in New Zealand and elsewhere have been attempting to engage with these concerns, notably with the cultural health index developed by Tipa & Teirney (2003) and other approaches to evaluating more narrative kinds of relationships (Harmsworth 2005; Harmsworth *et al.* 2011; Tipa, 2010; Tipa & Nelson, 2008). While there is increasing attention being paid in both research and policy to the more holistic and interpretive relationships between people and their environments[12] (Collins & Kearns 2010; Panelli & Robertson 2006), figuring out how to prioritise and give effect to these relationships through planning objectives and facilities is still largely unresolved. Moreover, in the New Zealand situation, particular attention has to be paid to recognising the concerns of iwi as a Treaty partner, in addition to their role as stakeholders in their own rights across a range of fronts.

[12] For instance, in a list of "important national values", the National Policy Statement includes "providing a sense of place for people and communities" (Ministry for the Environment, 2011: 4).

2.3. What is nationally significant?

Objective A2 of the NPS on Freshwater Management requires that councils protect "outstanding freshwater bodies", which are those with "outstanding values, including ecological, landscape, recreational and spiritual values" (New Zealand Government, 2011).

Section 6 of the RMA also requires that councils, as "a matter of national importance", recognise and provide for "the natural character of … wetlands, lakes and rivers and their margins", "outstanding natural features and landscapes", "significant indigenous vegetation and significant habitat", and more.

The RMA also provides for Water Conservation Orders (WCO) to recognise and sustain outstanding amenity or intrinsic values of waters in their natural state and to provide for the protection of a range of characteristics including habitat, fishery values or scenic values, scientific, recreational or cultural values (among others).

There are currently no criteria or process that enables consistent assessment of the significance of these values. While the statutory provisions for a WCO provide some consistency in process, WCOs have been applied for in an *ad hoc* fashion, *i.e.* there is no national overview of which water bodies should be subject to WCOs.

The government attempted to identify water bodies of national importance through its Waters of National Importance (WONI) project (Section 5.1). However, there was no consistent methodology or criteria developed for these assessments and no attempt to link significance at a national level with significance at the regional level.

Given that decision-making is at the local or regional level, it can be difficult for a regional council to determine what is nationally important without some input from a national level, *e.g.* from experts, stakeholder groups, government policy or some other source. The High Court has held that evidence from experts outside a region is relevant for considering 'significance' for regional planning purposes[13].

The need for a methodology to assess significance of freshwater uses and values gave rise to RiVAS, described in Section 5.1, and eventually to the Valuing Our Waters (VOW) case study in the Tasman District.

[13] West Coast Regional Council *vs* Friends of Shearer Swamp CIV 2010-409-2466

3. THE TASMAN CASE STUDY

The Tasman Valuing our Waters (VOW) case study brought together an interdisciplinary team to frame the challenges facing regional councils in managing freshwater for diverse values (Section 1.4). With the benefit of this framing, the team convened a series of workshops to tackle the challenges faced by the Tasman District Council (TDC) in incorporating values for freshwater bodies in Schedule 30 of the Tasman Resource Management Plan (TRMP). While focussed on this particular topic, the workshops would also enable the project team to explore some of its wider questions around the determination, interpretation and incorporation of multiple expressions of value in freshwater management (Section 1.3.2).

About 20 people from across Tasman District who are key 'voices' – people who are experienced and informed on some aspect of how freshwater is used and valued – were invited to participate in five full-day workshops. Participants were not asked to represent a particular sector or interest group in the sense of advocacy, but simply to share their particular knowledge and experience to help TDC make better decisions and inform the research observations distilled in this report.

Over the course of five workshops, the project team aimed to meet TDC needs and investigate the research questions listed in Section 1.3.2. The initial workshop design aimed to:

- Review existing assessments of freshwater values in Tasman, identify what is missing, and discuss aspirations for change.
- Explore inter-relationships between uses and values – where are they complementary and competing.
- Consider alternative management scenarios for specific freshwater bodies and the extent to which these would provide for a range of uses and values.
- Assess the potential of decision-support approaches such as RiVAS and choice modelling.

3.1. Methodology

An action research approach was used to ensure that the workshops were able to evolve, and to support on-going learning about the research questions as well as about the TDC challenges and the effectiveness of the workshop process. A key characteristic of this action research approach is collaboration, which enables mutual understanding and consensus, democratic decision-making and common action (Oja & Smulyan, 1989, p.12).

In this sense the action research team works with others to seek improvements in their client systems. This help takes the form of creating conditions in the behavioural world of the client system that are conducive to inquiry and learning. In short, the method aims to improve problem situations and to develop public knowledge and capability that can be applied to similar situations elsewhere.

The steps involve an iterative process of planning, acting and reflecting. In this project, each of the five workshops can be seen as one full cycle of planning, action and reflection. The rigour in the research comes from the collaborative and reflective nature of the research. The research team continually peer reviews their own findings and conclusions in the light of each disciplinary perspective and informed by international and New Zealand literature and practice. At each workshop, participants provided additional reflections on what had emerged. This final report brings a further layer of reflection from the research team.

As part of the action research approach to this project, there were two team planning exercises. The first set up the overall workshop structure and sequence and the second set out the broader research and decision-making context around values. There were also frequent teleconferences to reflect on each workshop and plan the subsequent one. Figure 3 illustrates the intersection between the progressive workshop development and project team planning, analysis and review.

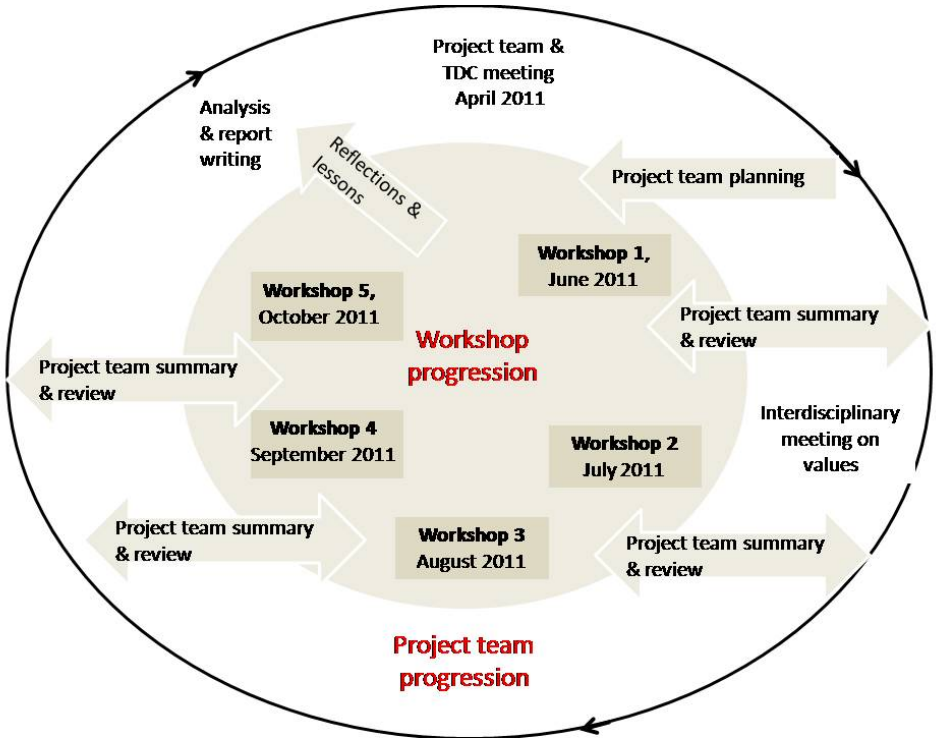

Figure 3. Research team planning and workshop sequence.

Overall the project emphasised social process to provide for good engagement and discussion among people with a range of perspectives. Putting people at the heart of the integrative process involves more people thinking about the wider management process and its aims, and being involved in working with the different tools that can be brought into the decision-making process. Commonly referred to as social learning, it involves people in sharing diverse experiences and perspectives in order to develop a common understanding and basis for on-going actions (Berkes, 2009; Kilvington *et al.* 2011b; Schusler *et al.* 2003). Underpinning the concept is the recognition that people learn through active adaptation of their existing knowledge in response to their experiences with other people and their environment. Importantly this learning goes beyond individuals to become situated within wider social units or communities of practice (Reed *et al.* 2010). This is synonymous with adaptive management and learning-by-doing (Holling 1978; Lee 1993; Walters & Holling 1990).

3.2. Research team approach to values

As noted in Section 1.3, the context for the case study was TDC's need to resolve outstanding submissions on its resource management plan, including identified gaps in the schedule of uses and values, past work with RIVAS, and the wider research objective to test methods for incorporating values into freshwater decision-making.

Schedule 30 was first introduced into the TRMP in 2001 and stakeholders identified a number of concerns at that time. As well as concerns that the schedule was not complete for all values or for all rivers, one of the key criticisms was in relation to the language of significance for some values *e.g.* some values or uses were identified as having national or regional significance. The RiVAS project was a response to the identified need for a systematic approach to assess the relative significance of river uses and values. The RiVAS methodology was applied to a number of uses and values of Tasman rivers and showed some promise as a tool to assist Council in making decisions about river management. TDC had been involved in the development of RiVAS and was looking to fine tune its practice and application within its wider planning framework.

While it is readily recognised that different individuals and groups in society may hold different values for the same object, the way we frame the discussion about values can also influence the valuing process itself. To address this, the project team included members from several disciplines and with diverse perspectives on values, and attempted to design and frame the workshops to address the research questions without marginalising the range of views present. The research team included members with experience in economic valuation techniques and reductionist approaches to value ranking and comparison, scientists and planners accustomed to working with specific (reductionist) objectives and indicators, and team members whose interests were in the interrelationship of values and the processes of engagement in valuation itself.

This project represents the research team's exploration, with a group of community stakeholders, of concepts of value and how values are reflected in freshwater planning. As shown in Figure 3, this occurred before and between the workshops and, in particular, at a team meeting (see Section 4.3) held the day before Workshop 3, and continued during the writing of this report.

3.3. Outline of Tasman workshops

The five VOW workshops progressed at monthly intervals spanning from June 2011 to the end of October 2011. Twenty-two stakeholders from a variety of backgrounds were invited to take part in the workshop series (see Appendix 2 for the list of workshop participants). Attendance at each workshop varied, with a minimum of 14 (Workshop 4) and a maximum of 18 (Workshop 1). Other participants included those invited to make presentations on specialist topics and the six members of the project team. Table 1 provides a summary of the objectives of each of the workshops, the information presented and topics discussed.

3.4. Workshop planning; creating a platform for dialogue and learning

The aim of the VOW workshops was to create a platform for dialogue, information exchange, debate and learning. To do this it was necessary to plan for both physical and process components.

The physical component refers to the location and timing of events but also includes their relationship to other influential contemporary events. In this case, it was important to consider how these workshops might feed into upcoming revisions of the TMRP. It also meant considering the influence of nationwide changes to freshwater management brought about through the recently released National Policy Statements (NPS) on Freshwater Management and Renewable Electricity Generation and on-going discussions in the Land and Water Forum (LAWF).

The process component refers to the way in which participants are engaged and conversation is facilitated. Engagement processes can be designed to address different social learning needs such as resolving a longstanding conflict, taking collective action on an issue or constructing a model to understand the different factors in a complex system.

Table 1. Overview of the Valuing Our Waters (VOW) five workshops.

Workshop details	Objectives	Information introduced/workshop session and presentations	No. of participants
Workshop 1 14 June 2011 10.00am – 4.00pm	• Enable a group of people to come together and begin to build a platform of common language around values and water management. • Build understanding of the challenges of working with multiple values in resource management policy and planning.	• Concepts found in the literature around values and resource management (such as held and assigned values) • Commonly used categories of values (direct use, indirect use, intrinsic, bequest, future options). • Māori atua frameworks for understanding values. Presentation by Dean Walker (Kawatiri Resource Management) • Schedule 30 – key element in TDC's approach to freshwater management.	18
Workshop 2 12 July 2011 9.30am – 3.30pm	• Extend understanding of Schedule 30 and its possibilities • Introduce RiVAS, how it works and how it aligns with Schedule 30 • Understand participant's views on proposed approach – are there other approaches?	• Clarification around the language of values. Presentation by Jim Sinner (VOW project team) • Understanding Schedule 30 - workshop session • Freshwater bodies of Tasman – information on hydrology of waterways and aquifers. Presentation by Martin Doyle and Joseph Thomas (both TDC) • RiVAS – current methodology and status. Presentation by Mary-Anne Baker and Jim Sinner (VOW project team) • RiVAS angling values. Presentation by Neil Deans (Fish & Game NZ)	16
Workshop 3 23 August 2011 9.30am – 3.30pm	• Determine purpose, scope, and limitations of Schedule 30 as a planning tool for TDC • Consider Schedule 30 structure	• Presentation of six key issues and queries drawn from Workshops 1 and 2 regarding freshwater management in the Tasman • Testing RiVAS information against participant's	17

Workshop details	Objectives	Information introduced/workshop session and presentations	No. of participants
		own knowledge of the Tasman – small groups • Different ways of thinking about values: o Tiakina Te Taiao values framework and work with RiVAS. Presentation by Kura Stafford, Marlin Elkington and Daren Horne (Tiakina Te Taiao Ltd. Resource Management Agency) o Holistic, outcome oriented vision development and its place in local water management and planning. Presentation by Marc Tadaki (VOW project team) • Two possible structures for Schedule 30, using 'straw-man' examples – small group session	
Workshop 4 21 September 2011 9.30am – 3.30pm	• Recapping and synthesis of collective understanding about water management processes and the role of Schedule 30 in Tasman • Linking broader visions and ambitions to planning and decision-making • Tools to help balance values – results of choice modelling online survey	• Synthesis and recap of progress to date - discussion with research team and whole workshop • Schedule 30 and the role of visions – small group session • Choice modelling (CM) survey. Presentation by Jim Sinner. (Further results from the choice survey were presented at a seminar at TDC on 13 December 2012, attended by TDC staff and four VOW participants.)	14
Workshop 5 25 October 2011 9.30am – 3.30pm	• How well does the proposed management framework work for the participants in terms of meeting their goals and needs for water management in the Tasman region? • What are the key process points going forward for the development of Schedule 30,	• Exploring decision-making in action: the Motupiko water augmentation proposal – case study small group sessions introduced by Andrew Fenemor, VOW project team • Processes going forward for completion of Schedule 30 and development of community	17

Workshop details	Objectives	Information introduced/workshop session and presentations	No. of participants
	and other aspects of TDC water management decision-making? • Wrapping up the VOW project –feedback information people can expect, and further opportunities for involvement.	visions	

The workshops advanced the research objective of learning how to incorporate values into decision-making and TDC's desire for improved freshwater decision-making. The workshops were also intended to offer participants the chance to enhance their own understanding of freshwater management and the challenges of dealing with conflicting uses and values.

The learning goals of the workshop can be described as both informative, *i.e.* gaining new knowledge, and transformative, *i.e.* gaining new skills and ways of understanding the world. To meet these goals, the following five principles and factors common to multi-stakeholder dialogue processes were addressed in the workshop design (Kilvington *et al.*2011).

1. Diversity: Understanding the range of values and the different ways in which people express the value of water bodies is a fundamental goal of the project. Diversity as a principle in the workshop design was primarily expressed through the wide span of views, knowledge and standpoints of the researchers and invited participants. Differences in the way in which participants framed their understanding of the issues were also recognised, so opportunities were created for presenting and discussing these different framings (see Workshop 4).

2. Respect and empowerment: Having invited a diverse range of participants, we needed to enable them to offer their views and cultivate their capacity to express them. The workshop design embodied an attitude of respect and empowerment through expressed appreciation and value for the time and effort given by participants, travel cost support for participants whose costs were not otherwise covered, and by providing a pleasant venue and catering. While participants were generally selected because they had previously exhibited willingness to contribute to discussions about local freshwater management issues, there was a range of degrees of comfort with public speaking. Participants had different cultural traditions in meeting and discussion, and catering for this was an important factor in facilitation.

3. Open-ended facilitation: While it was important to provide direction and intention for the meetings, the workshops required a balance between this and enabling sufficient freedom in discussion for the new and unexpected to emerge.

4. A staged approach: We intended a discursive and incremental pathway to understanding more about values for freshwater and the setting of management goals.Therefore the workshops were designed as a series of steps through which participants could develop the confidence and capacity to debate. This meant careful consideration of the various stages of the group coming together, as well as the gradual introduction of different concepts and information.

5. Reflection and workshop development: Fundamental to these workshops was the capacity to enquire, consider, reflect and if necessary re-build assumptions and ideas. Reflection, whether through formal evaluation or free form discussion, not only generates information which can be used by others; for the individual, it also helps

clarify what has been experienced and cements new observations and is therefore an important ingredient in conceptual development.

Each of the workshops generally ended with a feedback session as well as the completion of an evaluation form, both of which were used by the project team in the next workshop design. While a basic structure of workshops was generated at the beginning of the project, the project team quickly recognised the need for rigorous post-workshop reflection to prepare for the next workshop. The workshop design itself was therefore evolutionary and can be regarded as several cycles of planning, action and reflection.

3.5. Workshops: staged introduction of ideas

Each workshop included plans for how to develop and support the collective group capacity for dialogue, information sharing and making sense of information, such as small group sessions, different workshop exercises, and presentations. This is referred to as 'building capacity for discussion' in Figure 4, which illustrates the basic building blocks of each of the workshops.

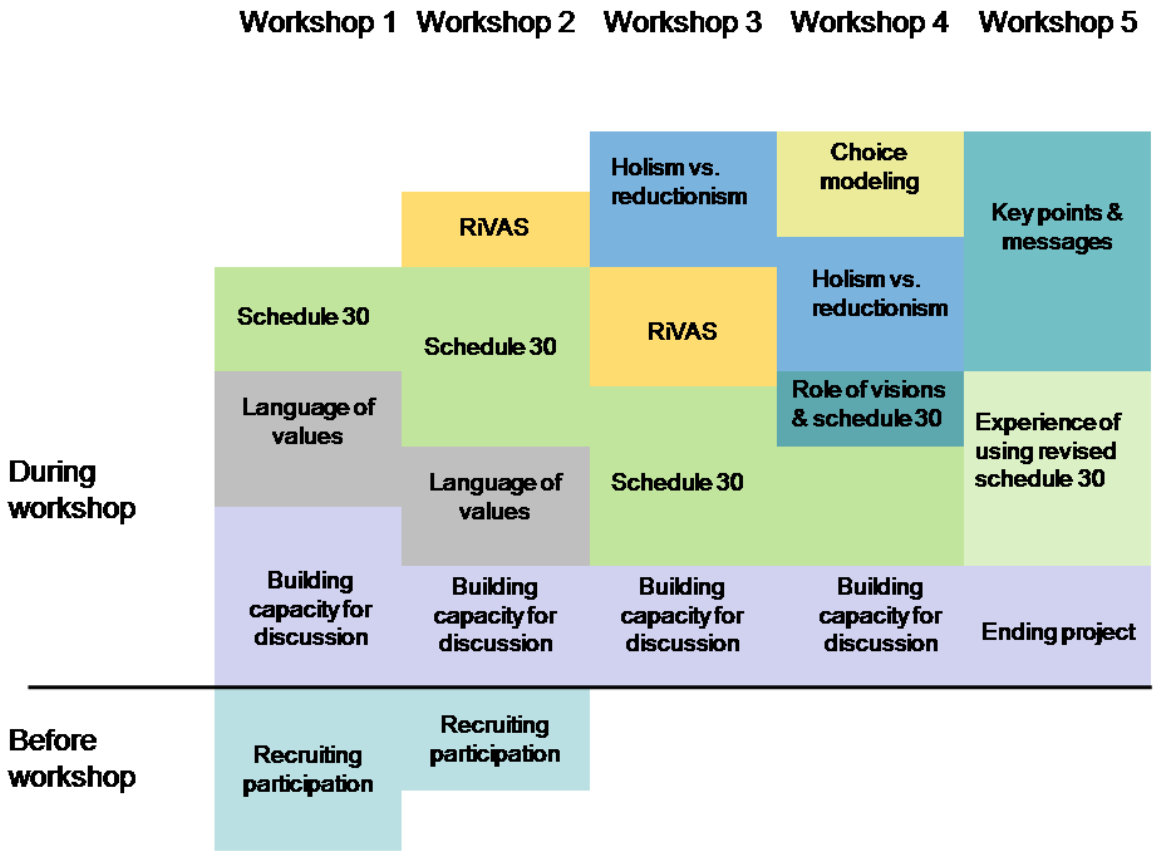

Figure 4. Building blocks of each workshop.

Valuing our waters

tasman district council

Nelson

Contact details: Mary-Anne Baker, Tasman District Council Policy Planner Ph 03 543 8486
Jim Sinner, Cawthron Institute Ph 03 548-2319

Landcare Research Manaaki Whenua

CAWTHRON INSTITUTE

We need your voice...

Valuing Our Waters is a joint initiative between Tasman District Council, the Cawthron Institute and Landcare Research. It brings together a wide range of voices throughout the Tasman area to combine ideas, thoughts and beliefs about the freshwater systems of our region.

Over five forums we will examine different approaches to understanding the values of our rivers, aquifers and wetlands and how we can make choices that help improve the management of these waters, in ways that are inclusive of the entire community.

Outcomes from these forums will be used to further develop the Tasman Resource Management Plan freshwater management provisions across the region. They will also be one of the ways we can respond to the new National Policy Statement on Freshwater Management.

We have identified you and about 20 others as people with a knowledge and keen interest in the freshwater systems in our region who could make an important contribution to this work. We would appreciate your involvement in this project and would like you to join us for the following forums.

Meeting 1	Tuesday 14th June	9.00am - 3.30pm
Meeting 2	Tuesday 12th July	9.00am - 3.30pm
Meeting 3	Tuesday 23rd August	9.00am - 3.30pm
Meeting 4	Wednesday 21st September	9.00am - 3.30pm
Meeting 5	Tuesday 25 October	9.00am - 3.30pm

Venues for the meetings will be confirmed by E-mail

Figure 5. Invitation card sent to prospective Valuing Our Waters (VOW) participants.

The recruitment phase was the first opportunity to communicate the intentions and philosophy that underpin the workshops. In the case of the VOW workshops the principle of diversity was reflected in the selection of participants. Factors included the different backgrounds and experiences of participants, whether they came as individuals or belonged to a particular agency with an interest in freshwater management, their cultural affiliations and the gender composition of the group. Furthermore, the initial phone call and follow up invitation (Figure 5) were designed to convey to participants the importance of the project and that they were invited because of their knowledge, skills, and experience that was highly valued by the project.

A first group of participants was identified from those who had already been involved in TDC water management processes and projects or because of their specific expertise. This initial list was supplemented by identifying gaps in sectors and interest areas that might have a unique perspective on needs, uses and values for freshwater management. As noted earlier, participants were not invited to represent a particular sector or interest group in the sense of advocacy, but simply to share their particular knowledge and experience.

The final workshop composition included representatives of tāngata whenua involved in local resource management and participants with backgrounds in farming, irrigation, hydro-energy power generation, freshwater ecology, commercial and recreational fishing, and water based recreation and sports. It included those with experience in advocating for environmental and conservation values, community health outcomes, and food production interests (although they were invited as experts rather than advocates). Two participants were also involved in the national Land and Water Forum (LAWF).

Participants were asked to commit to all five workshops (recognising that this might present some practical difficulties) and were particularly encouraged to attend in person rather than passing the invitation on to a colleague.
Of those contacted in the first round of recruitment, the majority were keen and able to take part in the project. Following the first workshop the participants themselves reviewed the group and decided there were some additional interests that were not represented, for instance users of the coastal environment affected by river discharges. An additional participant with knowledge of aquaculture was invited to attend the subsequent workshops.

Overall participation in the workshops was good and in most cases very consistent. Least consistent participation was from those unable to make the first meeting suggesting the importance of this initial gathering for setting the scene and creating an expectation of involvement.

4. THE TASMAN WORKSHOPS

This section summarises the discussions that took place at the five stakeholder workshops and the research team workshop.

4.1. Workshop 1

The intentions for this first meeting were to enable a group of people to come together and begin to build a platform of common language around values and water management. Before the substantive discussions began, Jim Skinner and Mary-Anne Baker described the objectives of the research and framed these in the context of the National Policy Statement (NPS) on Freshwater Management and Tasman District Council's (TDC's) Tasman Resource Management Plan (TRMP).

The meeting introduced concepts found in the literature concerning values and resource management and introduced some commonly used categories of values (direct use, indirect use, intrinsic, bequest, future options). Participants then took part in an exercise using these different value categories to both explore their usefulness and meaning and as a means of sharing their own values for freshwater.

The research team introduced the difference between 'held values' and 'assigned values' (Brown, 1984). Held values (sometimes referred to as ideal or core values) are concerned with the basis of value: beliefs about what is good, including what behaviours and policies will improve well-being. They are held by an individual but can also be community norms. In contrast, assigned (or preference) value is the relative worth or importance of a good or object in a given context, often specified as a particular kind. Assigned value can be either qualitative (better or worse) or quantitative (worth a specified amount, *e.g.* in dollars). Within this framing, participants were asked to identify some of their 'freshwater values', first in terms of held values and then in terms of assigned values.

A notable feature of the exercise on held values was the number of times that participants mentioned themes of life-supporting capacity and similar concepts that bridged stereotypes of nature vs. community vs. economy. A participant with a primary production background stated:

> *To me, the most essential value of water is to sustain all forms of life, all humans and creatures. But we probably have one of the most renewable resources of water around the world, and it's absolutely precious and we really sit on gold. So it's about how we balance it, and how we use it to benefit everybody. I think that's what this exercise is about.*
>
> VOW participant in Workshop 1

The held values reported by participants (Appendix 3) covered aspects such as spirituality, identity, the public aspect of water, the importance of water in its own right, social responsibilities and its wider role in safeguarding all life on earth.

The session on assigned values covered more traditional economic concepts such as direct use, indirect use and non-use values (Pascual *et al.*, 2010), as well as categories used in policy contexts such as economic, environmental, social and cultural well-being[14] (and corresponding values).

Dean Walker (a local resource management consultant) gave a presentation on Māori atua frameworks for understanding values, which not only illustrated the diverse ways of constructing meaning around values but highlighted the importance for Māori in determining their own value framework.

Jim Sinner (VOW project team) presented examples of how statements in resource management policies and plans are manifestations of values. As an example, he cited the water quality objective in the NPS on Freshwater Management:

> *To safeguard the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems of fresh water, in sustainably managing the use and development of land, and of discharges of contaminants* (New Zealand Government, 2011, Objective A1, p.6).

The connection between regional planning and national policy statements on freshwater management and renewable electricity generation was also discussed. The participants grasped the point that policy is an expression of values and in so doing they also highlighted the national context of the VOW exercise:

> **Participant A:** *There is an alternative view that [the phrase 'to the extent applicable'] implies that there is a values choice, which is also brought out in the NPS on freshwater.*
>
> **Participant B:** *I think it was difficult politically to be legally prescriptive, because the Government wanted to put some of that power back to the local communities and regions to have that conversation themselves rather than to be brave enough to set standards that could be universally applicable.*
>
> **Facilitator [to A]:** *Could you say again, what was the value choice you saw?*

[14] The Local Government Act 2002 states: "The purpose of local government is (a) to enable democratic local decision-making and action by, and on behalf of, communities; and(b) to *promote the social, economic, environmental, and cultural well-being* of communities, in the present and for the future" (emphasis added).

> **Participant A:** *We talked about freshwater values and the NPS on Freshwater, and we started talking about the objectives on quality, and it says "protect the overall quality" – it doesn't say "protect the quality". So it implies some sort of system of offsetting. The same thing is coming through in the Renewable Energy NPS, and in doing so, you are making a values choice.*
>
> Two VOW participants in Workshop 1

Schedule 30 of the TRMP was introduced as a key element in capturing understanding and expectations for regional water management, and it was noted that this would be explored further in the next workshop.

In reflections towards the end of the workshop, one of the Māori participants commented on understanding of each other's values:

> *I'm always feeling like we know more about you than you know about us [Māori]… So there is an inequity that happens, being in processes with councils and such, so that's just part and parcel. But what I like about this process is the face to face in the discussion, which is one of our key values, which is kanohi te kanohi. We are always advocating talking to people, to see your face, to know who you are.*
> *And like me just sitting beside my colleague from Federated Farmers, sometimes we are in adversarial forums, like in council hearings, so it's really valuable, at a personal level, to be able sit and talk and share our values. It gives you a greater understanding and appreciation of where they are coming from. So this is a good process. We won't all agree, but we'll be able to acknowledge each other's values.*

General issues raised during the meeting included:

- Need for care, clarity and agreement around the language of values and valuing, particularly around description and evaluation.
- Recognition that all frameworks are in some way limiting; need to be careful of what sits outside/gets missed out in any one way of looking at values.
- Need for discussion around TDC's intentions, current use of Schedule 30, and other options.
- Importance of remaining aware of the context and connections between regional and national level policy.

4.1.1. Project team review

De-briefing after Workshop 1, the project team questioned how useful the language of values is as a basis for discussing water management options. The tendency to confuse **values** with **uses** and **activities** had been evident in the meeting. Discussions regarding the tension between holistic and reductionist approaches for expressing values for water management also emerged. It was apparent that TDC's existing approaches tend to use reductionist language so the question emerging was how to accommodate those for whom this is less meaningful.

In the workshop participants were asked to state their goals for the workshop series. Some expressed quite ambitious agendas for influencing change in Tasman freshwater management in terms of both outcomes and process. The project team were conscious of the need to manage expectations.

4.2. Workshop 2

The overall aims of Workshop 2 were to extend understanding of Schedule 30 and its possibilities, introduce River Values Asessement System (RiVAS) and get participants to discuss these approaches.

4.2.1. Reflections on values from Workshop 1

Workshop 2 began with participants reflecting on the first workshop and on general context issues important to freshwater management. Following this Jim Sinner presented some clarification around the language of values which, coupled with some helpful qualification questions from participants, proved a useful basis for conversation during the day.

As Jim explained, from the discussion in Workshop 1, it was clear that among VOW participants and researchers, values terminology is used in several ways. In most cases, what people mean by 'value' or 'values' can be derived from the context, so there was no need to seek consensus on definitions of these terms.

4.2.2. A working definition of the terms 'value' and 'values'

This notwithstanding, as the project leader, Jim Sinner explained how he defines the terms 'value' and 'values', as this has inevitably shaped the design and course of the case study. This was not to argue that these definitions are the only way these terms can be defined.

Jim described his usage of these terms as follows, including a response to a participant's question:

> **Jim:** *Firstly, people have certain values or beliefs that shape how they evaluate the world they experience. So these are the values we as humans hold; they are 'held values'. (This corresponds to the third definition in Section 2.1.)*
> *Secondly, the things people experience in the world have value, as perceived by them. This is the value that we as people perceive or assign to things; sometimes referred to as 'assigned value'. Sometimes, these things are themselves referred to as values although in fact they are generally activities, or uses, or sources of well-being. They are a source of meaning or a way of mattering, rather than a value in and of*

> *themselves, but people often refer to them as values, as a sort of shorthand. (This report also adopts this shorthand by using 'uses and values' to refer to 'use and non-use' sources of value).*
>
> **Participant A:** *What about banded dotterel habitat?*
>
> **Jim:** *Banded dotterel habitat **has** value, for some purpose, but it is not itself **a value**. So in this project we're primarily concerned with identifying those **things that have value**, those things that are sources of value or meaning. We're interested in ways that we can assess the significance of that value for purposes of planning, for purposes for helping the community and council know how we should respond, how we should interact with the environment, what kind of rules or policies...or objectives for our environment.*
>
> **Participant A continued:** *In terms of determining what should go in [the Plan] and how should they be prioritised, going back to your first thinking around held values, often we have held values that we may need to open ourselves to scrutiny of what our held values are. And sometimes what I'm thinking with that is what should go in is what we deem to be significant, and so how do we unpack what is significant? Is there going to be something in the presentation about concessions, about how do we unpack what is significant. And the second thing is how they should all be prioritised. So are we going to unpack all the different ways that we prioritise?*

This project is primarily concerned with identifying sources of value or meaning and in ways to assess their significance for purposes of the TRMP. That is, which of these 'uses and other sources of value or meaning' should be listed in the TRMP? And how should the Council prioritise amongst these to guide its decision-making?

4.2.3. Introducing Schedule 30 and RiVAS

Participants worked in groups to develop a collective understanding about Schedule 30, its limitations and possibilities in addressing multiple values for water management.

RIVAS was introduced as a tool that has been developed to assess and document the significance of different water bodies for particular uses and values (Hughey and Baker, 2010b). A participant who was actively involved in the development of RiVAS explained how it had been applied to salmonid angling. For him, the value was not just in the resulting ranking of rivers for angling; it was also in the process of thinking systematically about what features make rivers good for angling.

Another participant, who had also been involved in a RiVAS workshop, noted mixed feelings about the methodology:

> **Participant A:** *The whole approach provides useful information but I think we need to be really clear about what its limits are, even in choosing the indicators and then choosing the thresholds. We are making decisions, at*

each one of those stages that are reducing and then reducing and reducing something so it becomes measurable. …
So I think there are issues in there that we need to recognise limit this. However, what gives me some pause for feeling OK about it is the independent reviewing of it to validate what the outcomes are. …
The issue for me about this RiVAS project steps back a level… We are tending to pick issues, whether it's irrigation, or hydro or bird life or whatever. We're kind of saying that's a value. And there is no indication whether this is a really big value that needs protecting under Section 5 or Section 6 of the RMA. Is this a section 7(d) value? The salmonid assessment covers the fishing and angling aspect of it. But when we talk about the habitat of native fisheries, it's a complex array of species that have different habitat requirements, so you start getting levels of complexity.
So [it's important that] we don't just become really focused on 'here, we have measurable outcomes. This provides us with this, we weigh it against that.' We end up with something that looks really good on paper, it works in a methodology but it's not actually doing what the RMA requires us to do, and essentially that's why we're here.

In the final session of the workshop, participants explored the use of RiVAS in association with Schedule 30, discussing its potential and concerns about limitations and methodology. Comments about RiVAS are summarised in Table 2.

Table 2. Participants' comments about RiVAS at the end of Workshop 2.

Positive	• The whole RiVAS process helps to pull together some useful information. • The process was interesting and useful, and could be used in collaborative decision-making to assist different groups to understand each other's values. • The RiVAS process is objective rather than being reliant on subjective information. • Transparency is a major benefit, as it is unclear how the current Schedule 30 was designed.
Negative	• Not clear how to deal with potential or past values of systems that have gone downhill and which could be improved in the future. • The weighting for decisions, and how the significance comes into this, could be based on the current political climate, so the weightings and the priorities could change.
Other	• Reliable data is obviously required, and in some cases might require agencies to go out and collect more of the data.

4.2.4. Project team review

In response to the varied feedback on Schedule 30, the project team decided to create 'strawman' alternative versions of Schedule 30 for the next workshop.

The project team also noted that some participants might not be aware that they were framing values in a particular way, one that others (notably iwi) did not share. This led to a decision to invite iwi to make a presentation at the next workshop.

4.3. VOW research team workshop on values

The day before the third VOW workshop in August 2011, the research team held a full day team workshop to discuss different disciplinary perspectives on values. Additional viewpoints were brought to the discussion by Suzie Greenhalgh (researcher in policy and economics), Garth Harmsworth (Māori resource management specialist) and Shelagh Nobel (landscape planner).

The workshop consisted of three parts:

1. An examination of the wider context of freshwater management.
2. A review of the different perspectives on values and how these manifest in decision-making.
3. Consideration of a range of research approaches that can be used to improve how values are incorporated in freshwater management.

4.3.1. The wider context of freshwater management

The research team identified factors that contribute to the challenges of freshwater management experienced by regional councils today.

There is a growing realisation that we are reaching resource limits in some areas, and there is a consequent need to anticipate and find ways to minimise conflict around resource allocation. This is more challenging where the knowledge of the resource limits comes after the over-allocation of the resource and decision-makers have to review previous allocations.

Moreover, the context in which we manage or make policy around natural resource management has changed over the past 20-30 years. There are more stakeholders wanting a say, which brings with it increasing tensions between the needs and aspirations of urban residents and rural enterprises.

In New Zealand there is an additional requirement to take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi). This requirement is interpreted differently by regulatory bodies when considering consultation, management or ownership with regard to freshwater management, which adds to the complexity.

As New Zealand society has become more urban and incomes have risen, expectations regarding freshwater management have changed over time. Landscapes that were once conceptualised only as agricultural systems are now seen as having value for tourism, recreation and conservation, and as impacting on downstream freshwater and coastal environments. Management efforts are consequently redirected from simply increasing productivity to improving sustainability, including by managing cumulative effects. Accordingly we see a move towards integrated resource management approaches with emphasis on community involvement, social learning and whole-of-system approaches to land and water management (Allen *et al.* 2011; de Loë *et al.* 2009; Fenemor *et al.* 2011).

However, hampering this move towards integrated resource management approaches has been an oversimplification of decision-making that compartmentalises different land and water management decisions rather than improving the capacity to make decisions with consciousness of interrelationships. Similarly there has been a lack of recognition of human dependence on well-functioning and resilient ecosystems or, to put it another way, the need for reciprocity between humans and the environment.

Driven by these forces, the notion of managing for multiple values has become a focus of resource management thinking and practice. However, not all resource allocation decisions are framed as being about contested values – rather they can be framed simply as an argument about who gets what. In discussing what a consideration of values adds to decision-making, the following questions emerged:

- How is identification of values linked to decision-making?
- What would be lost in the conversation if we didn't use the term 'values'?
- Is it sufficient to identify and assess 'assigned values' to manage for desired freshwater outcomes (see Section 2)? Or do we need to understand 'held values' and Māori world views in order to move towards these outcomes?
- Do values actually exist or do people simply construct them for a given context?
- In resource management decision-making there is a move towards the reification of values; to make them concrete, tractable, measurable and manageable. What is the counter-argument to this? What is the alternative?

4.3.2. Different perspectives on values in decision-making

The research team then discussed the question of how values are used in decision-making, including the following topics:

- The categorisation of values and whether this form of representing values captures the ways that water bodies matter to different people.
- The values which are commonly missing or marginalised in decision-making processes – notably landscape, intrinsic, spiritual, cultural or the role of place;

and the situation where values are prioritised because of the relative power of the spokesperson.

- The challenge of incorporating interconnected values (*e.g.* white baiting and community identity) in current decision-making mechanisms.

Suggestions for the future included the need to clearly specify outcomes, including strategic goals that recognise the bigger picture. Processes for stakeholder participation are also important to enable diverse voices to express less mainstream perspectives.

4.3.3. Research approaches to including values in freshwater management

This led to a discussion of the approaches that could be used to support the consideration of values at different points in the freshwater decision-making process. These included RiVAS, hearing process tools and expert panels, as a means to identify and assess the significance of values; economic tools such as CM as a means to understand priorities; and approaches such as participatory Geographic Information Systems (GIS), which helps people to understand the spatial aspects of a system.

All decision-support mechanisms need to be coherent, efficient, transparent and trustworthy. Capacity for engagement in decision-making is also a consideration, and social processes such as collaborative knowledge building and conflict management are important components of a decision-making approach that is responsive to values.

4.4. Workshop 3

Workshop 3 was a critical point in the five-workshop series, as it needed to lay the foundation for eventual outcomes of the workshop series, in particular any proposed additions to Schedule 30.

The workshop was designed to provide both the raw data and the conceptual basis for adding detail to the Schedule, and was in three sessions:

- Mapping values for Tasman District's freshwater bodies
- Different ways of thinking
- Alternative structures for Schedule 30.

4.4.1. Mapping values for Tasman District's freshwater bodies

In this exercise, three groups of 6-8 participants each reviewed maps of two different water bodies. One group reviewed the Takaka and Aorere Rivers (Golden Bay), the

second group looked at the Matakitaki and Gowan Rivers (Murchison area), and the third considered the Waimea and Motueka Rivers (Tasman Plains). Each group was provided with lists of uses and values currently included in Schedule 30 and, where available, significance rankings provided by expert groups using RiVAS.

Within the groups, participants discussed:

- Additional knowledge they had about the uses and values of the water bodies
- Which uses and values are mutually compatible, and can all uses be accommodated?
- How might management objectives for the water body be expressed - taking all uses and values into account?

This exercise generated many issues about the categorisation and reduction of values, the validity of the RiVAS approach in particular areas, and what uses and values were missing from Schedule 30, *e.g.* for the Gowan and Matakitaki Rivers: gold mining, natural biodiversity, the landscape features of braided rivers, use of rivers for school education. The tension between native and introduced species was noted, as was the need to be consistent with the Buller Water Conservation Order, a statutory instrument that includes provisions for the Gowan River.

The idea began to emerge of high-level, long-term and outcome-based thinking to complement more detailed and specific approaches to identifying important water management values and objectives, as shown in this exchange:

> **Participant A:** *There are two things, one is the actual framework i.e. a schedule of values, and the other is the process of how to use it. The piece that I would like to add is that it would be useful - although it might be very cumbersome, costly and no one would want to buy into it - it would be useful if we had a vision of what we wanted for a particular stream, and we measured ourselves according to our progress towards that vision.*
> *And in that view you don't set these minimum standards, you set what it is that you want from the river and on a yearly basis you say "Did we achieve anything? Where are we falling short? Let's talk as a group, as to how we can cover those." Now, unfortunately that doesn't fit into the RMA process, but trust me, at some point in time in the future, we'll be doing that kind of stuff. We'll have to.*
>
> **Participant B:** *From a strictly planner's point of view, something coming across my desk, the more detail is there the easier it is to tick the boxes, so that's nice and simple. But from a practical implementation point of view, it's really the outcomes-based stuff that you're after. And I think these points that were just raised hit the nail on the head as far as I'm concerned.*
>
> **Participant C:** *Just following on from that, the step before that is, I*

still haven't seen but maybe I've missed something, is there a schedule of what the current state of our rivers are?

Participant D: *In terms of river water quality, and our fish life, we do have some reasonable information about that.*

Participant E: *We had a brief discussion around monitoring and evaluation of plans, and most of the focus is on State of the Environment monitoring because that's what we're managing, but there was a question around are we evaluating the right things? Are we evaluating social, cultural and economic wellbeing that is affected by our water management provisions? And I don't think we do at all, actually, and I don't know how we do it usefully. Maybe it's another conversation for another day but I think that's something we really need to bear in mind.*

VOW participants commenting on the mapping exercise

4.4.2. Different ways of thinking

Kura Stafford, with Marlin Elkington and Daren Horne, presented perspectives of Tiakina Te Taiao Ltd., a resource management agency working in the Tasman District on behalf of local Māori and trialling the RiVAS methodology with local iwi. A key point from the presentation was that, while Māori have preferences about development in a holistic sense, these cannot necessarily be reduced to a formula, metric or indicator, and parts of the environment, cannot be treated separately to the whole.

Marc Tadaki (VOW project team) followed with a presentation that wove together a number of issues emerging from the morning's discussion into a principal theme concerning holistic, outcome oriented vision development and its place in local water management and planning.

The presentation by Tiakina Te Taiao included an historic map of the Motueka Plains showing numerous wetlands and other features now lost to development, with a comment that these places had been important as food sources and for other purposes. This led to the following exchange:

Participant A: *We're never going to restore that level of wetlands, that's impractical. …you can't just demand that land owners put that back, it's uneconomic. So you need some sense of how far you go. …It's very easy for these ideas to have a devastating ripple effect out in the community.*
… I hear a lack of reality in this room. We can very easily get down to ideals that aren't practical out there. Visions have to be in tempo with the time, not too idealistic.

Participant B: *… a vision doesn't have to be one that you will necessarily attain, that's the first point. So if someone had a vision that it would be nice to have the Motueka area all in a wetland like it once was, that doesn't actually bother me, and I don't think*

anyone should consider that a threat. It's just, you know, it would be nice to have a few more wetlands. You don't have to go running around knocking on people's doors saying, "well, you've got a canning factory there but we're actually going to have a wetland".
The second thing I'd add is that we seem to have gone into an either-or space, but it's not an either-or space, we just need to know what it is that we like and what it is that we want. And we can have what we know about now and we put into that what we want to have in the future as well, that's a part of the process.

Exchange among participants at VOW Workshop 3

4.4.3. Alternative structures for Schedule 30

The final exercise of the day looked at two possible structures for Schedule 30 (straw men) prepared by the project team. To prompt thinking and discussion in the small groups, the team highlighted six issues and queries about Schedule 30 drawn from Workshops 1 and 2:

1. Schedule 30 simplifies complex uses and values into a relatively small number of categories; how to recognise more nuanced values?
2. How to integrate when value is linked to more than one water body?
3. How to provide flexibility for when circumstances change? What is the appropriate balance between certainty and flexibility?
4. RiVAS is mostly based on existing condition; what about potential for restoration?
5. How to avoid ending up with 'sacrificial catchments'?
6. How should Council decide which uses and values get listed? How 'significant' is significant enough to be listed?

Participants in groups discussed the pros and cons of the two models for Schedule 30.They also discussed whether the schedule should include objectives and standards as numerical limits or qualitative descriptions; whether Schedule 30 should record potential for restoration or development, and what threats might there be to existing uses and values.

4.4.4. Project team review of Workshop 3

The project team considered that large themes had emerged from the discussions but also a great deal of detailed information that would require time to process outside the workshop. Overall the team felt that too much was asked of participants – and that the workshop was not the best setting for generating specific information on values and particular water bodies as it encouraged discussion rather than reaching agreement on definitive answers. There was also some sense from participants that they were

rehashing material. This led to an acceptance that the original ambition for the workshops was unlikely to be achieved and to a substantial simplification of the agenda for Workshop 4. The issue of vision statements as a means of expressing holistic and interrelated values for freshwater bodies had also emerged during the workshop and this was developed further in Workshop 4.

4.5. Workshop 4

Workshop 3 revealed the challenges of using a group process to map uses and values using a limited number of categories and with limited time. It seemed clear that the group was not ready to balance competing values and recommend management objectives for one or more catchments. The project team therefore revised its aim to one of getting direction from VOW participants on how to structure Schedule 30 to support decision-making involving freshwater values.

Workshop 4 had four sessions –

- Synthesis and recap of progress to date
- The role of vision statements in freshwater management
- Choice Modelling (CM) work in the Tasman District
- Reflections and preparation for Workshop 5.

4.5.1. Synthesis and recap of progress to date

The first session of Workshop 4 began with each member of the project team reflecting on and discussing two questions:

- *What are the main things you have learnt from the workshops so far?*
- *What expectations have changed for you over the workshops?*

Participants appreciated this session as an opportunity to see how the project team's, and their own, thinking had evolved over the workshop.

Discussion points included:

- The project had so far highlighted that while identification and categorisation of values is useful to decision-making, this reductionism is problematic and there needs to be some means of addressing the more holistic and integrated aspects of freshwater management.
- The idea of 'significance' in values is necessary but also has challenges. There is a need for consistency but also an understanding of the changing and

temporal nature of significance, and guidance on how to deal with temporary impacts.
Some participants object to the notion of 'significance' as misleading – *i.e.* leading to illogical comparisons between local, regional and nationally regarded values.

> *I'm uncomfortable about using the term 'significance' with national, regional and local vs high, medium and low. How do they relate? Something can be very important at the local level, so how does this fit?"*
> *"We need to avoid the tyranny of the status quo and remember both history and the future.*
>
> VOW participants, Workshop 4

- Transparency in the decision-making process is important, as is giving a voice to less powerful interests and those less accustomed to dealing with council planning processes.
- For some participants, the benefits of the project were the face-to-face conversations and the enhanced relationships between themselves and the council.
- Some participants stressed that they want a different way of doing things that provides a more proactive and longer term perspective to managing water, and more certainty for stakeholders, and one that they can have confidence in.

> *I will be really disappointed if this process ends up simply confirming the existing way we manage water.*
>
> VOW participant, Workshop 4

- Schedule 30 is a useful starting point for decisions, but it was still not clear how it will be used and how vision statements (or other formally articulated aspirations for water bodies and their associated regions) will fit into the process and how they will assist with decision-making.
- RiVAS is useful but has some limitations, *e.g.* there is still a need to balance uses and values where these are not compatible, and a need to make clear where these tensions lie.

4.5.2. The role of vision statements in freshwater management

VOW participants discussed in groups how vision statements, as a means of expressing long-term aspirations for freshwater bodies, could complement a decision-support tool such as Schedule 30. The discussion produced a rich set of ideas about the potential for the use of vision statements, how they might be generated and their

prospective place in resource management decision-making. The information from this session directly contributed to Section 5.2 of this report.

4.5.3. Choice modelling work in the Tasman District

In the next session, Jim Sinner presented preliminary results from the CM survey of about 250 residents of Tasman and Nelson Districts. A number of workshop participants also completed the survey. Jim noted that some of the results were counter-intuitive and that more analysis was required; participants offered some possible explanations (*e.g.* improved swimming in the Takaka River is not valued highly because most Golden Bay residents swim in the sea rather than in rivers). There was discussion about both the CM methodology and how such information could be used in decision-making. The CM survey and results are discussed in more detail in Section 5.3.

4.5.4. Reflections and preparation for the final workshop

In the final session of the day, participants reflected on key points and unresolved questions. These included:

- Where do visions sit? Should they be statutory or non-statutory?
- Can we create vision statements of richness rather than 'balance'?
- What are the processes for engagement around freshwater management needed to address conflicts?
- How can land use planning, *i.e.* spatial and visual, be brought into our decision-making processes?
- Decision-making about water management directions should cater for opportunities, not just for development but also for enhancement of ecosystem and intrinsic values.
- RiVAS as a tool has some limitations, it is not able to encompass all values or recognise the relationships between values.

At the end of workshop there was a strong, shared request from participants for the final workshop to include a practical scenario in a real decision-making situation.

4.5.5. Project team review

Workshop 4 had satisfying outcomes for the project team. The first session, which revisited goals for the project, had worked well and helped affirm the evolutionary nature of the project. The workshop sessions on vision statements had promoted good discussion and the feedback on the CM survey revealed a number of concerns

with the methodology. Valuable insights had emerged from the discussions on the role of vision statements, and from the reflections at the end of the workshop.

The project team acted on the request to create a tangible scenario and spent some time generating a workable case study for the final workshop.

4.6. Workshop 5

Workshop 5 had three main objectives:

- To assess how well the proposed management framework meets participants' goals and needs for freshwater management in the Tasman region.
- To consider key process points for the further development of Schedule 30 and other aspects of TDC freshwater management decision-making.
- To wrap up the VOW project and let people know what further information they could expect.

4.6.1. Reflections on Workshop 4

As a prelude to the day, the outcomes of the previous workshop were summarised and reviewed. In particular a diagram of the role of values in the decision-making process, outlined by Andrew Fenemor in Workshop 4 and augmented by Will Allen and others, was revisited. With the shaded area representing the focus of the VOW workshops, Figure 6 shows how a vision statement expressing holistic values and Schedule 30 documenting reducible values can complement each other in the decision cycle. It also highlights that power relationships will influence all aspects of the cycle, including how values are elicited and expressed.

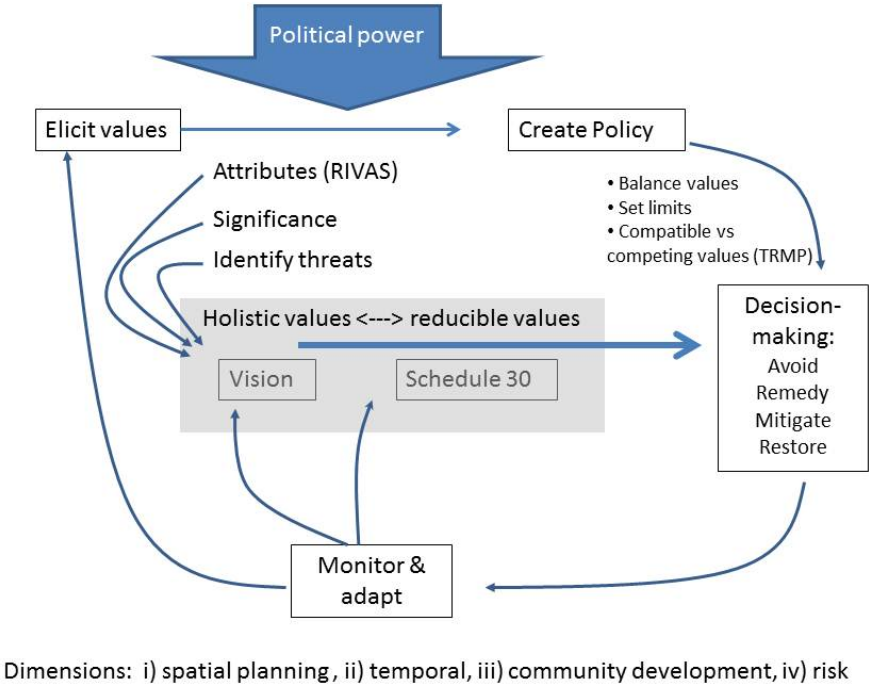

Figure 6. Visions, values and power in freshwater decision-making.

The group's reflections on Workshop 4 produced some interesting comment. Most participants liked the idea of adding to Schedule 30 a vision statement for each catchment, mainly as a way of involving people and enabling a broader conversation.

> **Participant A:** *What came out for me from the last workshop is just how damn difficult it is to come up with practical tools to actually implement the vision.*
> **Participant B:** *The thing that worries me about the word visions is that spatial planning is the really important aspect of it. It is actually working out that different parts of your region have different emphases. That spatial element is difficult to do under the RMA unless you have a planning framework which encourages it to happen, actually plans for it, puts all of the dots together, and I ask for that discussion to happen.*
> *And yeah, call it a vision, but I think actually it is about spatially looking at the region and working out what bits of the region have different weights of values. ... There's obviously got to be just as much room for protection as there is for development, so you have to work out where and how that happens, so that you protect the really important things and still enable the development.*
> **Participant C:** *Looking at the diagram, I still have a problem, because you're not in an orthodox situation defending fish or defending birds or defending scenery. For things like that, it's*

very easy to elicit the values and to list the attributes. But very difficult to say what you're going to do about them, and that's where your vision for those things would come in. It's too late at Schedule 30, you're dealing with the nitty gritty. You've lost the opportunity to say, "No, we're not going to change the skyline, we're not going to bulldoze the Ruby Bay bluffs, we're not going to allow a road to be built across the face of a limestone scarp."

We were once the best trout-fishing destination in the world. That's changed. The godwits are gone because the sediment has covered their feeding grounds in the estuary, just things like that. We've got to define at what point that comes in. … I just don't see a strong line in there anywhere, where you put your line in the sand. Which worries me because otherwise the whole thing is a compromise, it's all about how much can we get away with changing things all the time. You know, when you wake up as a trout fisherman each morning, you're asking yourself what are you about to lose.

And everybody says "oh bloody trout fisherman and Fish and Game, we're always fighting them, they're always fighting us" - well they're not, actually. All they're doing is actually defending. You know, it's quite a different process, and it's an attitude… I'm interested in seeing Nelson remain a world class trout-fishing destination – it's that simple, I've got to look for where that comes in the process.

Participant D: *This isn't a single track railway, it's a multi-track railway. There was a comment about talking in terms of the future, and also about development, restoration AND mitigation. It's about planning and looking forward rather than stopping things in time and looking backward.*

Participant E: *Aren't we in some way struggling to go against the philosophical concept of the RMA being effects based legislation? We're waiting till we're seeing something going wrong, and we've identified even in what we're doing that you've got to start much earlier on. So the political power and controls are in fact a step down, and if you follow to the letter of the law, you wait till the end for something to happen. It's got to be turned on its head by the politicians.*

Participant F: *This is all very nice but the practicality... we haven't even put economics on the board yet, and fitting all these things in is really hard because you might not get voted in. If you say you're going to restrict activities on land, it's a really hard thing. What do you say when you've got ten properties in a catchment, three of them have intensified land use and you can see the detrimental effect. Do you say ok you three can carry on and you seven can't increase at all? Or do you say you three have to come back to best practice and you others can develop a bit? You've still got to skin the cat on a very tough level.*

VOW participants reflecting on the role of Visions

Several issues emerged concerning the potential for vision statements to shape freshwater decision-making at different scales. These can be summarised as follows:

- How can capacity for spatial planning be better enabled within current RMA constraints, *i.e.* deciding what activities (including development *vs.* protection broadly speaking) will go where?
- How can the dynamism of changing demands, values, and knowledge about the system can be incorporated in planning strategies and approaches?
- How can community development aspirations be understood and discussed alongside environmental and resource capacity limitations and opportunities?
- Where are risks assessed and addressed in the planning and decision-making system? Can a vision statement anticipate threats and establish limits as well as identify aspirations?

4.6.2. How does the framework work for you?

The day's second session involved a mock decision-making exercise prepared by the project team based on an irrigation proposal for the Motupiko Catchment (Appendix 4). Participants worked in groups to consider how well the proposed framework for Schedule 30, including a vision statement for the catchment, would support decision-making. The overall response was generally positive but a number of challenges were raised about the detail and process of generating both a vision statement and Schedule 30. These comments have directly contributed to Section 6, particularly Section 6.4, of this report.

4.6.3. From VOW to where?

The project team and participants discussed the issues raised by the VOW forum around the use of visions, the role of tools such as RiVAS and the completion of Schedule 30, and how these issues would be progressed by TDC.
On the question of whether Schedule 30 needed to be complete before it is used by TDC, there were still opposing views.

> **Participant A:** *The Schedule should not provide direction for changing objectives, policies and methods until it is more complete. My understanding was that these workshops were to identify how we can complete Schedule 30 before we start using it.*
>
> **Participant B:** *But decisions will continue to be made in the meantime. Do we just ignore the information we currently have in Schedule 30 regarding uses and values?*
>
> **Participant A:** *I would like to see more recognition of economic value and food production, and for us to work with growers in locations where these are important.*
>
> Exchange between two VOW participants

As other participants joined in, the discussion evolved into a consideration of how to engage with the wider community to get more information on uses and values for particular catchments. Recommendations included:

- Engage with sector and interest groups over their values, and amend Schedule 30 accordingly.
- Use Schedule 30 as an empowering tool for community discussions, possibly as part of helping articulate community values for use in vision-statements.

A provocative question from one of the participants drew a range of responses and further development of the possible role of visions:

> **Participant A:** *Referring to that article, a common view that he hears behind closed doors is that the country should accept the degradation of water quality so the economy can grow. And I just want to know where, as Tasman District, do we sit on that? We're sitting here as a group of people who have been dealing with these issues, do we think we're going to need to degrade our waters further to make our economy grow, or just to look after our wellbeing as a community?*
>
> **Participant B:** *I don't believe that we have to degrade our water to grow our economy. I think there's a growing realisation that we can turn things around. Science has proved that we can do both, we do know which direction we've got to go in and some good work is being done in some of our catchments.*
>
> **Participant C:** *I don't think we've got a choice - as your population grows, there's going to be degradation of your water bodies. It would be great if you could set some aside and say I'm not going to touch it there but we're going to be hard on those ones. Take the Maitai River, for example, you know, that's the water supply for Nelson. What happens in another 20 years' time when our population is another 10 thousand more people, where's that water going to come from? It's going to come out of that river for sure, and that river's water, that river catchment, will get worse. I don't see a solution to it.*
>
> **Participant D:** *With urban expansion, those urban waterways are renowned for getting degraded first.*
>
> **Participant E:** *Population control, we're back to the core issue.*
>
> **Participant C:** *I don't think you can stop it. You might be able to protect the river out there a bit more…*
>
> **Participant F:** *It seems to me that these exercises are all about defining what the priorities ought to be, given particular waterways, and also what the issues are likely to be, where the conflicts might arise, so that you can then devote your limited resources to try and address those conflicts where you think it*

is important to do so.

Participant G: *We're back to talking about generalities. I want to talk about where we prioritise different values spatially. I don't see a binary outcome for the region. I don't think there's a unilateral direction. I think there are multiple directions the community might go. It's about defining what those values are, where they land in the region, and making sure that they're all recognised. Not some of them, all of them. And yes, you're not going to get it right, but you should at least start with something that is reasonably representative.*

Exchange between VOW participants in Workshop 5

The discussion included some additional suggestions concerning the use of RIVAS:

- Include missing values where possible.
- Clarify ways to accommodate other (non-RiVAS) values.
- Improve the RiVAS methodology (*e.g.* for food production and hydro-electricity) and moderate the significance of special interest value sets such as kayaking.
- Clarify assumptions to ensure there is transparency.
- Ensure there is complete information to avoid incorrect conclusions.
- Distribute RiVAS results to relevant stakeholders for feedback and input *e.g.* in Hawkes Bay the kayaking community suggested some minor changes and then were happy with the outcome.

RiVAS is discussed further in Section 5.1 of this report.

4.6.4. Wrap up of the VOW project

The project team outlined the outputs expected from the VOW project and expressed their gratitude and appreciation for the consistent and high quality contributions of all the participants. A tremendous amount of ground had been covered in five meetings and, while the evolving nature of the project had meant that some expectations had not been met, new ones had been realised – leading to 'a better class of question'.

4.7. VOW workshop reflections and learning

Often after an intense set of collaborative experiences, participants have a sense that something has been achieved yet find it difficult to identify concretely what this is. The process of subsequent reflection and discussion about what happened is therefore a vital part of the realisation of the new knowledge. For the VOW project team, the five workshops provided just such a set of dense and rich experiences and the writing up phase, when each member has shared their recollections and observations, has been a vital part of interpreting what happened.

> *I feel the discussions in these workshops have been really good, but then I find it hard to describe to others what we're doing and what we've achieved. But I recognise that the task is more complex than we originally thought, and I hope that we can provide a framework and a process for the community to work through these issues.*
>
> *I want to throw away the word 'balance' and create richness and opportunity instead. … Community preference should be put alongside expert knowledge and Part II of the RMA. We need spatial planning to decide where we'll provide for different things, different land uses, in a catchment.*
>
> A VOW participant's reflection at the end of Workshop 4

On the workshop process itself a number of key observations emerged. The nature of the project was to address jointly goals which were practical and of immediate interest to the TDC and research aims which were to explore what was needed to step beyond the known limits of conventional approaches to freshwater management. These joint aims had to be held (and juggled) by both the project team and the workshop participants. This is conceptually challenging to everyone and to those whose interest lay more predominantly with one goal, the experience can be continually frustrating.

> **Participant A:** *These five workshops could have been achieved in 2-3 days if at the outset schedule 30 was introduced/discussed in more detail.*
>
> **Participant B:** *Progress seems slow during the workshop. Discussion seemed to head off in all sorts of directions – necessary but a bit frustrating.*
>
> Two VOW participant reflections in the final evaluation form

Nonetheless indices such as continued participation by the majority of participants (indeed, limited attendance was largely confined to those participants who had not attended the first meeting), and the comments from the final evaluation forms suggested that there was both acceptance and appetite for meetings that were open-ended and exploratory in character.

> **Participant C:** *Liked the flexibility the workshop organisers exhibited in adjusting the flow of each meeting. Was at times confused by some of the process, but in a way that stimulated more involvement as a way to learn and make a 'more' meaningful contribution.*
>
> **Participant D:** *Initially sceptical given the high representation of research/science/government cf. other interests – however encouraged by some of the rigour in the discussion around process and engagement of community.*
>
> Two VOW participant reflections in the final evaluation form

Groups of people coming together, even for a limited set of occasions, tend to follow stages. First they establish relationships and boundaries (a tentative and polite stage

of interaction), followed by a more challenging stage of renegotiation when ideas are evaluated and contested, which can be quite confrontational. From here, groups may pass into a stage where their goals and ways of working have been normalised and they progress to a point where they cease to meet or move onto other goals (these are loosely the 'forming, storming, norming, dorming and performing' stages identified by Tuckman (1965)).

The VOW workshops followed a similar trajectory. In Workshop 1, participants politely shared their core values and ambitions for the project. Workshop 3 was difficult for people and was the point at which both the project team and the participants realised some of the limitations of what they might achieve. For the project team it was a realisation that workshops of this nature were not the best forum for extracting definitive answers from participants and for processing detail.

> **Participant D:** *This was a critical learning for me. I was pretty stressed during Workshop 3 – and hence missed some of what was happening – because I knew that it was crunch time for dealing with the detail of Schedule 30 and I could see that it wasn't going to happen the way that I had planned.*
>
> A project team member's reflection

For the participants there was frustration at revisiting Schedule 30 without having really addressed the challenge of how we weigh up incompatible uses and values.

> *…making a cake rather than a recipe.*
>
> A VOW participant's reflection in the final evaluation form

However, having passed through this, both Workshops 4 and 5 progressed more smoothly.

> *Felt like group dynamic improved after third meeting – trust/familiarity developed.*
>
> A VOW participant's reflection in the final evaluation form

Indeed in the final evaluations, several participants commented on how useful the final case study exercise in Workshop 5 had been, sometimes expressing the wish that this had happened earlier. However, when we recognise that all five workshops were a progression of the capacity to work together as a group, it is not clear that putting such a task to the group earlier would have resulted in the same outcomes.

Observations from participants' final evaluations are worth noting for their strong message about the value of meeting one another in a non-confrontational forum, unbounded by specific regional planning outcomes:

> *Safe environment, lots of ideas/experiences shared in constructive ways around problems.*
> *I am delighted by how productive stakeholder people openly supported the process.*

> *Good to hear concerns/substantive issues from all sides.*
> *Good cooperation and collaboration between everyone at the meeting.*
> *The overall quality of expertise present at the workshops.*
> *Felt like group dynamic improved after third meeting – trust/familiarity developed.*
>
> VOW participants' reflections in the final evaluation form

Overall, the project participants commonly expressed a positive response to having taken part. It had enabled them to express their interests and their ways of valuing freshwater and given them the opportunity to meet and learn from others with a wide range of knowledge about freshwater and the Tasman region. Some participants expressed some hopes for how this work might be progressed:

> *Maybe it would be useful to have a Stage II involving more landowners/interested parties (i.e. roadshow).*
> *I hope the discussions we've had can be built upon to produce a schedule 30 that is near complete and useful.*
> *The non-existent level of any sense of conflict between participants. This is an 'asset' that TDC officials can use to gather further opinion or future comment on Schedule 30 issues.*
>
> VOW participants' reflections in the final evaluation form

5. TOOLS, TECHNIQUES AND APPROACHES

Regional planning is a complex and iterative task, which takes place over a long period of time. As shown in Figure 6 (Section 4), eliciting and assessing values is part of a management cycle that also includes policy making, implementation, and evaluation. This section discusses in more detail some of the tools, techniques and approaches for eliciting and assessing values that were tested or explored during the Valuing our Waters (VOW) workshops, and conclusions about the future use of these tools for freshwater planning.

5.1. The River Values Assessment System

Following the first State of New Zealand's Environment report (MfE, 1997), central government looked to provide non-legislative support to regional authorities in the form of a series of reports on Waters of National Importance (WONI) (MAF, 2004; MfE, 2004a; MfE, 2004b). These reports sought to identify, evaluate and rank New Zealand's pre-eminent water bodies for a range of natural, recreational and economic uses. This was intended to help prioritise freshwater management objectives in terms of the national interest and particularly to help clarify the term 'national importance' in the RMA[15] , but the assessments lacked consistency across uses and across water bodies, and councils did not derive much from the intervention (Hughey and Baker, 2010a).

The River Values Assessment System (RiVAS) was conceived by practitioners and researchers who sought to respond to WONI's inconclusive project to identify nationally important water bodies for various uses. In particular, the Tasman District Council (TDC) was adding a schedule of uses and values for each water body under its jurisdiction to the Tasman Resource Management Plan (TRMP), and wanted a defensible basis for stating the significance of these uses as suggested by the language of 'national importance' in the RMA (Hughey, 2008; Hughey & Baker, 2010a).

Funded by an Envirolink[16] grant in 2008, RiVAS was designed and developed through a series of workshops to "list, objectively, [the] relative significance of river values in [a particular] region" (Hughey & Baker, 2010a).

[15] See http://www.legislation.govt.nz/act/public/1991/0069/66.0/DLM231907.html#DLM231907 (Accessed 5 Nov 2011). The RMA Section 6 requires that councils "recognise and provide for …matters of national importance" including" the protection of outstanding natural features and landscape", "significant indigenous vegetation and significant habitats of indigenous fauna" and "the relationship of Maori and their culture and traditions with their ancestral lands, water, sites…", among other physical and human resources.
[16] http://www.envirolink.govt.nz/

The stated purpose of RiVAS is:

> *To outline an explicit and standardised method to develop assessment criteria and significance thresholds for multiple in- and out-of-river values. The method can be applied to national and regional planning under the RMA (e.g. to generate lists of rivers graded by relative importance for different uses which, in turn, provides information to guide freshwater management decision-making for a range of policy interventions/actions) and for other appropriate purposes (e.g. as advocacy tools) (Hughey et al. 2010).*

5.1.1. What RiVAS does

The RiVAS methodology involves developing, for a selected use or value, a multi-criteria analysis using attributes and indicators to score rivers within a region for their significance for that value.

RiVAS assessments are conducted by expert committees, which have ranged in size from one to eight, usually including one or more from the RiVAS steering group (Hughey & Baker, 2010a). The expert group identifies a set of attributes for the selected value, usually a mix of precursor (causal) factors, *e.g.* water quality and flow, and resultant outcomes, *e.g.* frequency of use and distance travelled by users.

In selecting attributes, the expert group seeks to recognise, to the extent possible, the diversity within a given use or value (*e.g.* from novice to expert kayaker; toddlers, teenagers and adult swimmers; *etc.*). In one sense, every individual will view a river through a unique lens and value a river slightly differently than others. RiVAS abstracts from this reality in order to classify and assess rivers to assist management by local authorities.

An indicator is identified for each attribute, a simple 0-3 scale devised for scoring each indicator, and scores are summed for each river. Rivers are then ranked and grouped, based on their scores, into rivers of national, regional and local significance (or, in some cases, high, medium and low significance) for the selected value.

In conjunction with several regional councils, attributes, indicators and a scoring method have been developed for the following uses and values (and the region in which each was first developed):

- Salmonid angling (Tasman)
- Swimming (Manawatu-Wanganui)
- Native birds (Canterbury)
- Whitewater kayaking (West Coast)

- Natural character (Marlborough)
- Tangata whenua (Māori) values (Southland)
- Irrigation (Canterbury)
- Native fish (Tasman, Gisborne).

Methodologies for the following uses and values are under development:

- Hydro-electric power generation
- Whitebaiting
- Water supply for domestic purposes.

5.1.2. RiVAS results for Tasman District

RiVAS has been applied to six uses and values in Tasman District, the results of which are summarised in Table 3. Tasman rivers have been assessed as having national or high significance for natural character, salmonid angling and kayaking.

At the catchment level, the Table 3 displays the highest level of significance for a given value, even if it is for a small site. Consequently the Motueka River has nationally significant natural character because the Wangapeka River (or a portion thereof) was assessed as having nationally significant natural character, even though most of the other tributaries are regionally rather than nationally significant for this value. If recorded in a spatial database, a user could drill down to see precisely what portion of a water body had been assigned what level of significance, and potentially even the attributes and indicators that contributed to its ranking.

Table 3. Results of RiVAS significance assessments for six values of Tasman District rivers and selected sections and tributaries.Catchment and cluster names are highlighted in blue.Only a few tributaries are shown for demonstration purposes, and because some rivers have been assessed only at catchment or cluster scale.

River catchment	Section of river or tributary	Natural character	Native birds	Swimming	Angling	Kayaking	Irrigation potential
Motueka		National	Regional	Regional	National	Moderate	Regional
Motueka	Upper Motueka	Regional	Regional				
Motueka	Mid Motueka	Regional	Local				
Motueka	Wangapeka	National	Local				
Motueka	Lower Motueka	Regional	Regional				
Waimea		Regional	Local	Regional	Regional	Moderate	Regional
Waimea	Roding	Regional					
Waimea	Lee	Regional		Regional			
Waimea	Wairoa	Regional			Regional	Moderate	
Waimea	Wai-iti/Waimea	Local			Regional		
Takaka		National	Regional	Regional	National	High	Regional
Takaka	Cobb	National			National		
Takaka	Waingaro						
Aorere		National	Regional	Regional	Regional	Moderate	Regional
Moutere							Local
Buller		National	Regional	Regional	National	High	Regional
Buller	Matakitaki	Regional	Regional				
Buller	Fyfe	National	Local		Regional		
West Coast rivers		National	Local				Local
Abel Tasman rivers							
Coastal Golden Bay rivers				Regional			Local

5.1.3. Issues and concerns with RiVAS

As noted in Section 4, many VOW participants saw RiVAS as a useful tool but one that has limitations and non-transparent assumptions (while the methodology and assumptions are well-documented in reports, these are not accessed by most people). Some participants were sceptical about using Schedule 30, which is largely based on RiVAS, before it is complete, while others felt that the information should be used for decision-making now and updated on an on-going basis. It was recognised that RiVAS will never capture all the ways that rivers (or other freshwater bodies) matter to people.

There is also still a need to set priorities where uses and values are not compatible for a water body, and a need to make clear to decision-makers where these tensions lie. For example, the methodology looks at a single use or value and not at clusters of values (or clusters of rivers). It is possible that a number of uses and values, such as

natural values together with a number of recreational uses, could contribute to an assessment of a river as 'outstanding'.

Any method using common indicators and assessment frameworks for natural systems that are inherently diverse and unique will have its limitations. This section considers some of the limitations of RiVAS described by Hughey *et al.* (2010) and additional issues identified during the Tasman workshops and project team discussions. It is important to acknowledge and consider these, so that the methodology and its results can be used appropriately.

The politics of categories

The choice of which categories to assess, and how to define them, can have implications for regional planning. By measuring some categories and not others, RiVAS is liable to exclude groups of people and particular "ways of knowing" the world, especially those which cannot be quantified or translated across spatial contexts (Meppem & Bourke, 1999). Hillman *et al.* (2008) refer to such exclusions as barriers (institutional obstructions) to authentic connections between people and landscapes.

The initial selection of categories (values) for which RiVAS methods were developed was done by the original project steering group in consultation with a collective regional council entity known as the Surface Water Integrated Management (SWIM) group. The resulting set includes, arguably, those most commonly identified and debated in resource management deliberations in New Zealand. Methods can similarly be developed for any other use or value of rivers or other freshwater bodies. Any group or interested party can convene an expert group for that purpose; the credibility of the resulting application would likely depend on the recognition of the experts by their peers and the wider resource management community.

This tends to highlight the fact, however, that uses, values and ways of knowing rivers that do not have recognised 'experts' or user groups or associations will tend to be under-represented in regional planning. This is not a fault of RiVAS *per se*; it is rather a short-coming of existing approaches to planning that RiVAS does not solve.

Categories are problematic for another reason; how a given use or value is defined also has implications. During the VOW workshops, some participants suggested that the category of 'irrigation' does not adequately reflect the use of land and water (including the effects of land use on water) for primary production. There were suggestions that, for purposes of setting objectives and priorities for catchments, the significance of food and fibre production more generally, for example in terms of food security, should be assessed and considered. This view of irrigation highlights that the label used for a use or value might influence its perceived importance relative to

others, as ‘water for food security’ is more likely to be supported by a local community than water for irrigation.

The suggestion that the significance of land use for food production should be assessed alongside more direct uses of water also highlighted the need for integrated planning across land and water to meet a number of objectives, not just equitable allocation of water. Land use can have significant effects on natural character, water quality, flood control and eventually the quality of the coastal environment. If these effects are not taken into account, the objectives for freshwater management are unlikely to be achieved.

Another example is the choice of whitewater kayaking as a category, rather than the more general ‘kayaking’ or even ‘boating’ which could include rafting, flat-water kayaking, rowing, sailing and windsurfing. This issue was acknowledged by Hughey *et al.* (2010), who allowed for river values to be sub-divided into “categories”, to be described and separately assessed “at a meaningful level of detail”.

The question arises whether swimming should be assessed separately for teenagers and families with small children, who are often looking for different attributes in a swimming site. This was reflected in the swimming assessment where rivers with a range of opportunities for swimming scoring more highly than rivers providing either one or the other. The expert group decides the appropriate definition for a value to be assessed based on the commonality of attributes across different styles of that value. The degree to which an expert group judges this correctly is likely to be reflected in the acceptance, or otherwise, of the resulting rankings by the interested members of the community, *e.g.* swimmers. This could be addressed through further consultation; ‘socialising the results’ with interested parties.

Assuming that different styles of a given use are best suited to different rivers, then splitting a use into categories is likely to increase the total number of rivers that are assessed as having high significance for one or more use. Depending on how RiVAS results are used in the planning process, there is a risk that some stakeholders would see it as a ‘numbers game’; splitting uses such as boating into multiple categories increases the number of ‘significant’ values that are acknowledged and documented by a regional council and therefore (it might be perceived) increases the likelihood that boating and related uses will be provided for when the council sets its management objectives. However, the more detailed the definition of categories, the less people any one will apply to and the less weighting might be given to it, and the fewer the number of water bodies where those high rankings apply. The political economy of RiVAS practice and outputs has yet to unfold.

'Existing value' *vs* 'potential value'

The original RiVAS methodology assesses rivers on the basis of existing condition for passive uses and values, but assesses potential value for irrigation and hydro-electric power generation. This provides no basis for assessing the potential enhancement of instream uses through changes in flow regimes or improvements in water quality. This has been addressed by the development of a 'RiVAS+ method' that assesses rivers first on existing condition and then on potential, for all uses and values (Hughey *et al.*, 2011).

For this purpose, Hughey *et al.* (2011) have listed numerous interventions that can improve river condition for a range of uses and values. However, not all interventions can be assessed, and returning a catchment to its 'pristine' condition (however defined) is not, in most cases, likely to be a realistic option. Thus, practitioners are advised to identify the rivers within a region that would most benefit from improved condition for a given value and, for those, the interventions that are considered politically and economically feasible. While the resulting RiVAS+ assessments consequently have a greater degree of subjectivity, the method provides a means to identify and assess aspirations for improving river condition for instream and passive uses and values, and for these to be considered alongside aspirations for development such as for hydro-electric power generation and irrigation. The RiVAS+ methodology is being trialled in assessments being done for Gisborne District Council, so far with satisfactory results (Hughey, pers. comm.).

Degrees of 'significance'

The RiVAS methodology calls for expert groups to identify threshold scores to determine whether rivers are of national, regional or local significance, arising from the original motivation for development of the methodology. This terminology has led to some issues.

The expert groups that develop a national methodology for a given value are tasked with determining the criteria for national, regional and local significance. In some cases, this is driven primarily by a particular 'trigger' attribute, *e.g.* the presence of at least 5% of the total population of a threatened native bird species. For other values, expert groups looked for thresholds within the ranked scores of rivers, and in some cases tested this by scoring rivers from around New Zealand that they considered were nationally or regionally significant. Of course, this might help to confirm that the thresholds are consistent with the experts' values but does not confirm that the thresholds are objective and robust.

Until the method for a given value has been applied to most of the regions within New Zealand, it is difficult to say with confidence what constitutes 'national significance'. Even then, guidance might be required as to the proportion of rivers that can be credibly be called 'nationally significant' for any given value, although one could argue

that this would vary depending on whether the value itself is nationally important. To cite an example, one would not expect to have the same number of nationally significant rivers for rowing (were this to be assessed) as for native fish.
At the other end of the spectrum, the distinction between local significance and no (assessed) significance is not always clear. Hughey *et al.* (2010) advise that, when applying a RiVAS method to a new region, a first step is to "remove those rivers considered to be of 'no' or less-than-local level significance for the value being considered" and to record the criteria used for this. These criteria are not always recorded, however. Yet when rivers are ranked in a later step, those below the threshold for regional significance are all, by definition, locally significant. It might be appropriate, therefore, to revisit at this step the criteria used to exclude a number of rivers, or even to assess some of the excluded rivers and consider whether their scores are in fact low enough to be considered 'not significant'.

For native fish and possibly some other values, the RiVAS method is being developed using national datasets that contain data for every river, meaning that every river can and probably will be assessed. Consequently, explicit criteria will be required to distinguish between local and no significance rather than assuming that all below a certain threshold are by definition of local significance.

Some uses and values of rivers are inherently local or regional. It is difficult to conceive of a river that is nationally significant for swimming, for example, but many would consider river swimming a significant component of New Zealand culture. And while the relationship of Māori with water is a matter of national importance under the RMA, Māori cultural values are regionally and locally determined by iwi, hapū and whanau. For Māori cultural values and natural character, which are deemed of national importance in s.6 of the RMA, Hughey *et al.* (2010) recommend ranking rivers as of high, medium and low significance to reduce confusion with national importance.

Gail Tipa, who led the development of the RiVAS methodology for Māori values, commented:

> "… whanau are likely to have detailed knowledge of the local river and accord it greater significance because it is their awa. This helps explain why it may be difficult to define local, regional and national significance – as in effect every **local** river that is used by whanau could to that whanau be the most important – *i.e.* **nationally** significant" (emphasis in original) (Tipa, 2010).

Assessing a river as nationally significant for a particular use or value could be taken to imply that the value in question should be given priority over other uses or values that are of regional or lesser significance. There is, however, nothing in the methodology to support this conclusion.

Because of the issues cited above, consideration is being given to recommending terminology of 'high, medium or low significance' for all uses and values until such time as a particular value has been assessed in sufficient regions to provide a good national picture (Hughey, pers. comm.). Another suggestion is to use 'high, medium or *local* significance', to avoid a perception that 'low' means 'not important' rather than meaning less important relative to high and medium.

Reductionism

Perhaps the most fundamental objection to RiVAS concerns its inherent reductionism. RiVAS is reductionist in that it abstracts from complexity and diversity in order to treat things the same way, *i.e.* to assess different rivers using the same set of attributes and indicators and then rank them. The method reduces diverse bundles of meanings around human-river relationships to discrete categories that RiVAS practitioners measure in a particular way. The multi-faceted experience of swimming in a river is reduced to the indicators used to evaluate it, as are Māori cultural values. The value of river systems is thereby reduced to the language of these categories and indicators. When deliberating over possible futures of rivers using RiVAS significance assessments, the language of the methodology will fundamentally shape these discussions about what is important and what is possible.

Although the term 'reductionism' can have negative connotations, reductionism is the basis for much of western science and resource management. It is, in many contexts, what enables humans to make sense of the world, to identify patterns and to infer cause and effect. Without reductionism, for example, scientists would need different methods (indicators, criteria *etc.*) to assess the condition of every freshwater body rather than making the simplifying assumption that many water bodies are sufficiently similar that one can draw useful conclusions about their condition using the same methods.

5.1.4. Conclusions about RiVAS

Like any new methodology, RiVAS has limitations and is still being refined to address these. RiVAS cannot represent all uses and values to the satisfaction of everyone, but it is possible to develop it further so that it can provide a better understanding of the relative significance of some uses and values within regions and across New Zealand as it is applied more widely. Priorities for further development of RiVAS are described in Box 1 (next page).

VOW participants who had been on RiVAS expert panels had increased their understanding about the use or value the panel was assessing. This highlights how knowledge is formed by experience and illustrates the benefits of involving people in a collaborative or social learning experience. By extrapolation, this raises the possibility that tools such as RiVAS can also be viewed as focal points around which to structure

wider community-based dialogues and learning experiences. This would help generate more useful discussions, while also building community capacity for these discussions – and subsequently enabling more active roles in decision-making.

It is important to recognise the reductionist nature of RiVAS while also recognising its potential usefulness for freshwater management. How might a council or community proceed in the absence of RiVAS or some other reductionist tool for comparing the importance of different rivers for the same or different uses and values? Or, perhaps more to the point, what methods can complement reductionist tools such as RiVAS to provide a more holistic perspective? One possible answer lies in visioning*, i.e*. the act of creating vision statements, discussed next.

Box 1. Priorities for further development of RiVAS

1. **Land use** – Because land use largely determines the condition of freshwater bodies, a framework is needed to assess the significance or contribution of land use for community well-being, to be considered alongside other uses and values of freshwater. This framework could be a RiVAS application for land use, primary production, or some other set of activities, or another approach that can provide relevant context for communities and decision-makers.
2. **Hydro-electric development** – A RiVAS application has been developed to assess the relative significance of rivers for hydro-electric energy, but it has been contested by the energy sector. The methodology could be trialled in a regional planning process to see whether it provides useful information for decision-making and how it can be improved.
3. **Other uses and values** – There is literally no end to the uses and values of freshwater for which categories could be defined and RiVAS applications developed. At present, whitebaiting and domestic water supply have been identified as priorities. Anyone, however, can use the methodology to convene a group of recognised experts and develop a set of attributes, indicators and a scoring system for another use or value.
4. **Potential value** – An extended RiVAS methodology (RiVAS+) has been developed to assess potential significance as well as existing significance of rivers for a given use or value. This methodology needs to be further tested and then its usefulness considered for informing decision-making processes, *e.g.* such as defining visions, objectives and limits (see Section 5.2).
5. **Socialising the results** – VOW participants were sceptical about RiVAS in part, though not only, because they perceived it be based on assumptions that are not transparent. In fact, the methodology is well-documented and not overly technical. Acceptance of the results is likely to be enhanced by discussion with a wider community of users for a given use or value and other interested freshwater stakeholders.
6. **National consistency –** To date, RiVAS has been applied only in a few regions for any given use or value, making it too early for a clear picture of national significance to emerge. As it is used more widely, it would be useful to convene one or more expert workshops to consider relevant criteria for setting thresholds for different levels of significance, whether it be national, regional and local; high, medium and low; or high, medium and local.

5.2. Visioning

5.2.1. Visions as an approach to values

There is a growing acceptance of the need to view freshwater management and planning as needing to accommodate diverse perspectives from a variety of stakeholders. Participatory approaches in many disciplines aim to support people planning and working together (Ostrom, 1990). Adaptive management and collaborative management can be practiced together as collaborative adaptive

management. Ecological economics has moved from benefit-cost analysis and estimating willingness-to-pay for discrete values to looking at value packages via multi-criteria analysis and choice modelling (CM) techniques. Of equal importance, some of these disciplines are looking to support integrated approaches, within a broader and more inclusive framing (Adams *et al.* 2003; Allen *et al.* 2011; Straton *et al.* 2011).

In line with this move towards integrated approaches is a shift in the discussions of values to focus on development paths and scenario analysis, that is, visions of the future as a starting point for strategy development and planning for transition management (Dymond *et al.* 2010). In this way we can choose development paths to protect a range of human values, recognising the multiple ways in which humans value nature (Norton & Noonan, 2007) and within the wider context of environments and communities.

From Workshops 2 and 3, the use of vision statements emerged as a way to help integrate reductionist listing and measuring approaches (*i.e.* RiVAS) and values with more narrative meanings for community members. After exploring Schedule 30 in detail in Workshop 2, a number of participants voiced their concern that the bigger picture was being left out. Discussions had generally focussed on what should or could be listed in the plan and how the categories ought to be managed by virtue of flow guidelines or specific council actions. What was lacking – and what participants increasingly wanted to discuss – were questions about why these measures were desired.

In many cases, the uses listed in the Schedule 30 are conflicting, and would translate to opposing management objectives. Some participants resisted what they saw as attempts to shape these choices through technical or structural approaches to the Schedule (through significance assessments or reordering the Schedule to list first ecological, then non-consumptive, then consumptive uses), and sought a more normative component to planning and management.

The concepts and language of vision statements were consolidated and developed through presentations by Kura Stafford and Marc Tadaki in Workshop 3, and informed the group discussion that followed. Kura discussed an iwi co-management arrangement with TDC in the Golden Bay area, emphasising that while Māori relationships with the land and water are not reducible to quantifiable metrics, this has not prevented meaningful discussion and prioritisation of action for iwi and Council.

Marc, building on Kura's intervention, drew on discussions in earlier workshops to highlight the terminology of vision statements. He argued that narrative questions about development and environment could and should be addressed in the TRMP, and that a reductionist approach to protecting uses and values harbours its own

assumptions and values about a better world. Participants embraced the vision idea as useful, and it became a key element for Workshops 4 and 5.

5.2.2. The work of vision statements

In the context used here, a vision is a statement or story about a future world that we want to live in. It can be used to generate a coherent set of goals and an action plan including monitoring their effectiveness (Gregory & Brierley, 2010; Ryder *et al.* 2008). Visioning offers an opportunity for creative description of the limits of a desired catchment state, expressed in terms which have meaning to catchment communities. A vision statement could complement reductionist standards and limits by painting an integrated picture of a catchment outcome. In the context of catchment management, a vision statement could be a narrative of community development, characterised, for instance, by swimmable rivers, public access to waters, increasing organic agriculture and large community income from farming and local town manufacturing. Vision statements provide a social and biophysical template onto which people can map or consider the relationships they find most meaningful now and into the future.

Vision statements, as a tool for encouraging a wider discussion about values, have benefits compared to (or complementary to) reductionist methods. A vision statement shifts the analysis from discrete commodities or concrete environmental changes to broader paths (trajectories) that can be evaluated on multiple scales of time and space (Norton & Noonan, 2007). It allows communities to think about many things that may matter to them, and it does not restrict discussion to predefined categories. While a river may have average or marginal water clarity and natural character, it may be very important to community members and they may want to preserve or restore this as a matter of place-citizenship. Encouraging communities to discuss what 'could be' rather than simply 'what is' creates new political and environmental possibilities.

It is important that vision statements are built to last. There are many examples of catchments and organisations that have built visions that seem to hold no weight and get revised with every new business fad, land use stress or financial opportunity. The key to creating a robust vision is taking care to ensure that the core ideology of the stakeholders is articulated (Collins & Porras, 1996; Kepros & Opreanu, 2009). The core ideology should be presented as a combination of the held (core) values (Section 4.1), and a core purpose looking out 50-100 years.
In this way, as Collins & Porras (1996) point out, these visions provide a benchmark that can remain timeless. Their strength is that they help us focus on the core ways and ideologies which humans value about the issue in question, in this case, catchments. Clearly practices and strategies should be flexible to help communities advance into an uncertain future. However, a community's core concerns remain relatively stable, and help to define the overall vision for catchments.

Secondly, visioning focuses on how things might be rather than how they are. For freshwater management, it is not the current significance of a use or value that matters, but rather how the value or its significance would change if the freshwater body were used or managed differently.

Because visions can depict futures at the catchment scale, we can consider catchment-scale environmental outcomes more holistically. River systems are complex, nonlinear systems and a consideration of social and environmental processes at the catchment scale can actually reduce uncertainty and provide more clarity about what environmental outcomes are reasonable and likely given certain types of changes (Brierley & Fryirs, 2005; Hillman & Brierley, 2008). Catchment-scale approaches to values can help target management interventions such as restoration efforts, and can allow the trade-offs between different land use trajectories or water use priorities to be made clearer.

In summary, vision statements, at least in theory, could be a useful instrument for effective environmental management. The challenges of doing this in practice are discussed next. However, perhaps the greatest merit of visions lies not in their instrumental nature, but their procedural possibilities. Because visions do not reduce water management discussions to predefined categories, they are perhaps more open to other 'ways that matter' and hence other languages of expressing those relationships. Visions enable a wider range of disciplinary perspectives and worldviews to be heard on what kind of a world is desirable. This discussion need not be exclusive to particular people with recognised expertise or particular ways that matter.

5.2.3. From visions to decisions

Visions are qualitative aspirations for community and environmental futures. While visions can be stated in many different forms, giving practical effect to visions in freshwater management gives rise to at least two general concerns from a planning perspective.

While visions might help to integrate a broad range of freshwater meanings, planners still need to translate these into management objectives and then into a series of environmental standards and thresholds, and so on. These provide the basis for deciding whether a resource consent is issued for an activity, *i.e.* whether it conforms to the vision statement. Some VOW participants stressed that, while visions might help to set the macro-level objectives, the intermediate and lower-level objectives, and the mechanisms used to achieve them, still need to be discussed.

> *"It is not enough to provide a broad vision and expect everyone to know what to do, or to expect scientists to feel comfortable with its lack of detail and potential scientific ambiguities. The vision is*

> *therefore decomposed into a hierarchical series of objectives which have increasing focus, rigour and achievability. Objectives are qualitative statements of the values defined in the vision and operating principles of the organization. They form a foundation on which to develop quantitative, operational goals" (Rogers and Biggs, 1999, p443).*

These quantitative, operational goals provide consistency and accountability to stakeholders, and a level of certainty for investors seeking consents as well as for instream users, which is an emphasis of the NPS on Freshwater Management. Quantitative goals and standards may be considered 'reductionist' because they necessarily apply to only a part of the freshwater system, and they are therefore derived using reductionist methodologies. However, they also can and should be seen as indicators of progress towards a vision, or as "thresholds of probable concern", *i.e.* "hypotheses of the limits of acceptable change" (Rogers & Biggs, 1999).

The validity and appropriateness of these thresholds are open to challenge, to be modified and adapted as understanding increases. When an expected change falls beyond a threshold, *e.g.* due to on-going land use change or a proposed new activity, the change and the threshold can be re-assessed relative to the higher level objectives and vision. The expected change is then accepted or rejected and the thresholds of concern modified if different thresholds are shown to better achieve the vision. If the thresholds and limits are included in the TRMP, as suggested in this report, amendments to the thresholds would be done through a plan change.

Rogers & Biggs (1999) provide an example from South Africa, while a less formalised New Zealand example can be found in the Twin Streams project in Manukau City (Gregory & Brierley, 2010). Note, however, that both of these examples pertain to restoration and management of reserves where relevant activities are mostly controlled by the management agency. Planning provisions that govern decisions about controls on private activities have a greater need for specificity because decisions are more likely to be legally contested; for the same reason, the specificity of planning provisions also needs to be rigorously founded. Reductionist science is often used in such situations to define and defend more narrowly crafted conditions and limits – the key is to remember that these are not the ends but rather means to the ends described in the vision.

The second, and related, concern has to do with the politics of detail. If visions are broad and ambiguous, they have little or no practical effect on decisions. While a vision might aim to open deliberative space for thinking about what futures are desirable, it may effectively 'kick the can down the road' for the real values discussion. There may be wide consensus on a vision for environmental sustainability, clean water and increasing organic agriculture, but what does this mean if the Council is not able to be held accountable through measurement against definitive standards or indicators? It is likely to be in the definition of such metrics that the real politics happens; again, there is a risk that people who cannot speak the language of

standards and concentrations will be excluded, and that debates around definitions can undermine the spirit and intent of the vision process.

This concern is surmountable, however. A burgeoning literature on 'participatory indicator development' (developing indicators collaboratively with stakeholders) highlights how local communities can and should define their own metrics as a part of the visioning process (Fraser *et al.* 2006; Reed *et al.* 2008). The development of categories of what is desirable cannot be separated from the metrics and approaches used to measure and characterise them. Through every step of the process, community knowledge and diversity matter.

This serves to highlight another point, which is that having an agreed vision and goals, setting standards, and establishing policies and limits will not create the desired future unless people in the community are engaged. Active engagement, such as land managers providing one-on-one advice (*e.g.* farm environmental plans), council funding for catchment works (*e.g.* fencing materials and plants) and stakeholder involvement in monitoring, is necessary to create 'ownership' and action by the local community.

It is worth noting, however, that the suggestion of communities identifying their own metrics moves in the opposite direction of government proposals to develop a standard or core set of freshwater indicators that councils would be required to monitor and report on[17]. While the two are not mutually exclusive, council resources for environmental monitoring are not limitless, so core indicators would ideally include those found to be most relevant for communities.

5.3. Choice modelling

> *Valuation, including economic valuation, functions as a system of cultural projection which imposes a way of thinking and a form of relationship with the environment and reflects particular perceived realities, worldviews, mindsets and belief systems. However, it can also serve as a tool for self-reflection and a feedback mechanism which helps people to rethink their relations to the natural environment and increase their knowledge about the consequences of consumption, choices and behaviour. (Brondizio et al. 2010).*

In August 2011, as part of the VOW project, two members of the VOW project team and researchers from Nimmo-Bell and University of Waikato conducted an online survey on the future of rivers in Tasman District (Bell *et al.*, 2012). The survey utilised an economic valuation methodology, choice modelling (Bennett and Blamey, 2001),

[17] See *e.g.* http://www.mfe.govt.nz/environmental-reporting/about/tools-guidelines/indicators/core-indicators.html

which estimates the relative strength of people's preferences for specific attributes of goods or services. One of these attributes is usually in monetary terms, for example the cost of visiting a site, which enables the researcher to estimate monetary values for changes in other attributes.

Choice modelling (CM) was identified in the original research grant as one of the methods to be tested for eliciting and assessing diverse values. The aim of the survey was to learn about the preferences of the wider community with respect to uses and values of Tasman rivers and, if possible, to indicate the relative significance of the uses and values identified in TDC's Schedule 30. This information, it was hoped, would assist the VOW workshops to agree upon objectives for at least some of Tasman's rivers.

The Tasman survey asked questions regarding broad reaches of three rivers: the Takaka, Matakitaki and Lee-Wairoa-Waimea. A research company was employed to recruit a sample of participants, as representative as possible, of local residents. A sample of 274 respondents (panel sample) was recruited from Tasman District and Nelson City, the latter being a separate but adjoining jurisdiction and hence home to many users of rivers in Tasman District. The survey was also advertised publicly, attracting 120 additional respondents (public sample).

Respondents were also asked to report some demographic and activity interests, including whether a family or household member is involved in farming. Table 4 shows the demographics of the two samples, and in particular the stronger interest group focus of the public sample.

Table 4. Self-reported activities of respondents to the Tasman rivers choice survey.

Self-reported activities	Panel %	Public %
Female (51% of local population)	70	47
Māori (7% of local population)	4	3
Environment and Conservation groups	8	38
Farming involvement	21	32
Boating	31	45
Fishing	35	32
Swimming	67	67
Walking/picnicking	74	87

5.3.1. Survey methodology

The survey asked respondents, for each of multiple questions, to choose between the *status quo* condition of a specified river segment and two alternative states. The state of rivers was described in terms of four attributes:

- Swimming, measured in days suitable during summer
- Boating (including kayaking)[18], measured in days suitable Sept-May
- Native fish and fishing, rated on a scale from 'poor' to 'excellent'
- Natural character, rated on a scale from 'highly modified' to 'all native species'.

Table 5 shows the *status quo* conditions for the three rivers.

Each alternative state had two additional attributes: changes in local jobs, ranging from 200 fewer jobs to 200 more, and changes in local rates (property taxes), ranging from $150 less to $200 more, per year for five years. The levels of all six attributes were randomly mixed for different respondents, and presented in random order, to generate a diverse set of choices and increase the power of the statistical analysis.

Table 5. *Status quo* conditions for the choice survey on three Tasman rivers, including ranges for swimming and boating attributes.

Attribute	Lower Matakitaki	Lower Takaka	Lee-Wairoa-Waimea
Swimming (days suitable)	50 (38 – 75)	80 (40 – 100)	80 (40 – 100)
Boating (days suitable)	175 (85 – 220)	160 (80 – 200)	140 (105–210)
Fish and fishing (suitability)	Excellent	Fair	Fair
Natural character	Mostly natural	Highly modified	Highly modified
Jobs in local area	No change	No change	No change
Property taxes	No change	No change	No change

5.3.2. Results from choice survey

Using statistical regression techniques, respondents' preferences for the above attributes were estimated for each of the three rivers. Because of differences in the composition of the two samples and the self-selection inherent in the public sample, the analysis concentrated on the panel data.

Using the panel data, coefficients for changes in natural character, fish and fishing, local jobs and property taxes were generally significant. For example, the average willingness-to-pay (WTP) estimate was about $250 per year for five years to avoid a change from excellent to good or fair in fish and fishing on the Matakitaki River. Average WTP to avoid a change to poor fish and fishing was about $600 per year, although the variation within the sample increased with the larger changes. That is,

[18] Given the nature of Tasman rivers, boating on these rivers would mostly involve whitewater and flat water kayaking, but might include some jet-boating and rafting as well.

there is quite close agreement within the sample on WTP of about $250 to avoid a change from excellent to good, but for a change to poor, the WTP ranges from $182 to $937 per year and the mean value of $594 was the largest WTP for any change considered in the study. Estimated WTP for fish and fishing on the other two rivers showed a similar pattern but with lower values, as the *status quo* condition on these rivers is not as good and they are consequently less used for fishing.

Figure 7 shows the results for fish and fishing. The vertical line for each variable shows the average WTP and the range for 90% of respondents. A negative value indicates a respondent would need to have a reduction in taxes of the indicated amount to feel no worse off as a result of the change in suitability for fish and fishing.

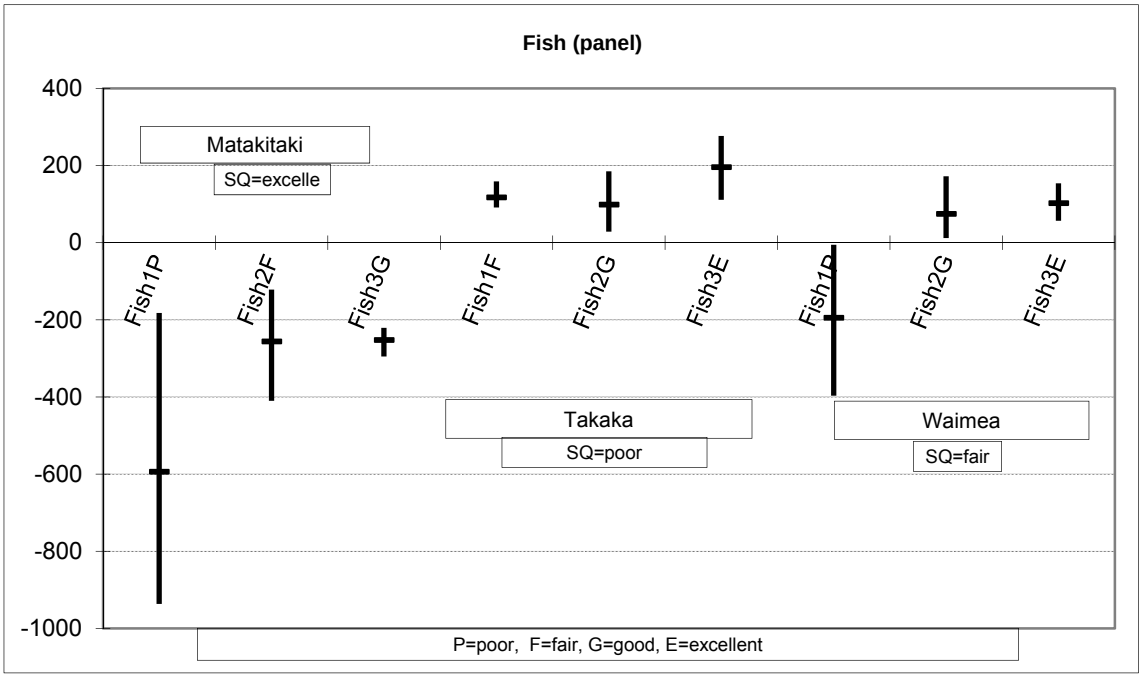

Figure 7. Estimated willingness-to-pay, or WTP (mean and 5-95% range) for changes to "Fish and Fishing" on Tasman rivers relative to the *status quo* condition, in dollars per year for five years.

The WTP for the natural character attribute (Figure 8) shows a similar pattern as fish and fishing: the values increase and have greater variance as they move further from the *status quo*. For natural character, average WTP values for the largest changes from the *status quo* were consistent at around $200/per year.

The WTP values for the 'Jobs' attribute (Figure 9) showed there was greater concern for job losses than job gains on all three rivers, especially for the Matakitaki River (WTP for loss of 200 jobs being $-472/year), though there was considerable variation in views.

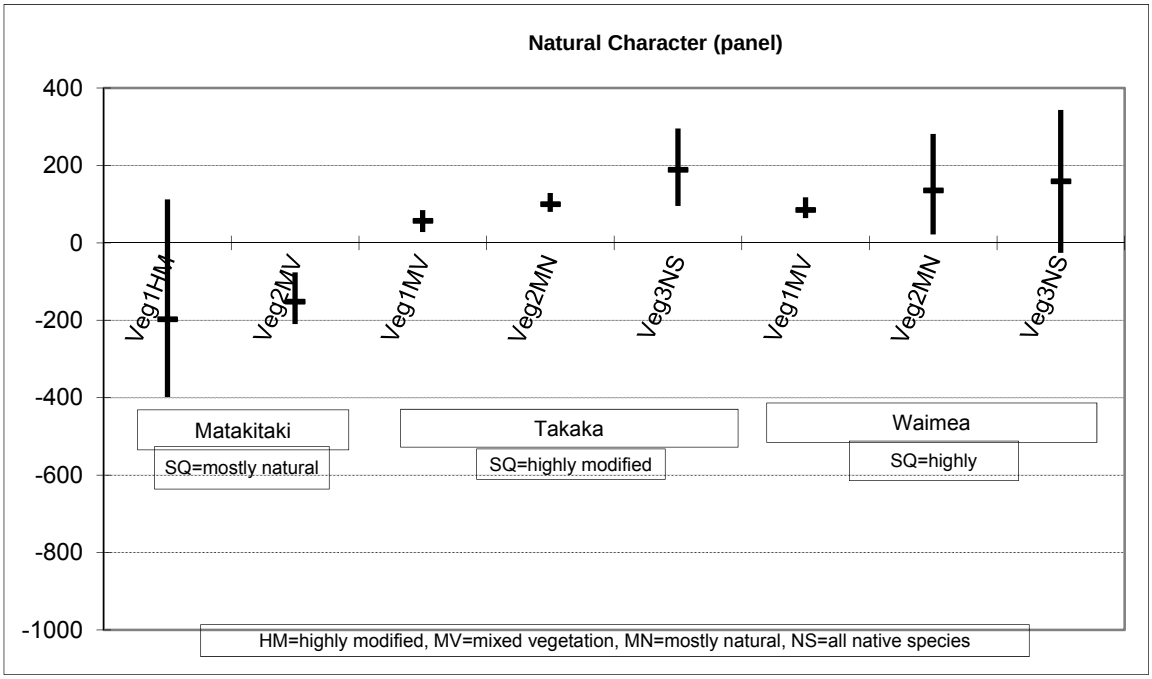

Figure 8. Estimated willingness-to-pay or WTP (mean and 5-95% range) for changes in the 'Natural Character' attribute for the three Tasman rivers relative to the *status quo* condition, in dollars per year for five years.

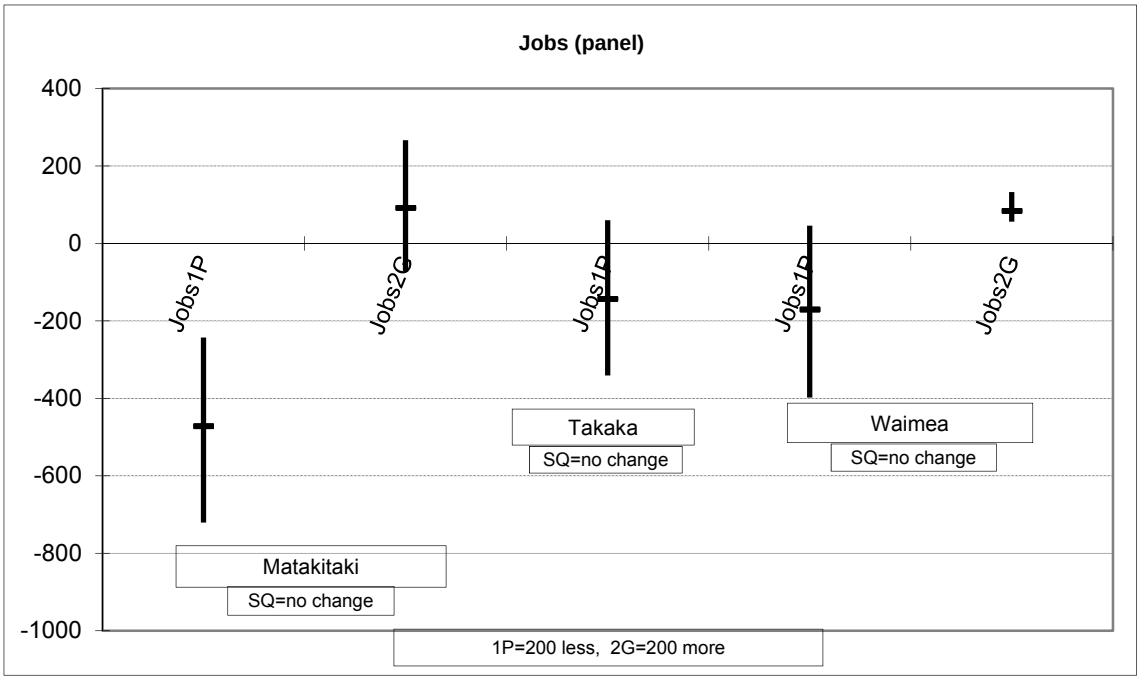

Figure 9. Estimated willingness-to-pay or WTP (mean and 5-95% range) for changes in the 'Jobs' attribute for the three Tasman rivers, relative to the *status quo* in dollars per year for five years.

Coefficients on the attributes Swimming and Boating were weak even though 67% and 31%, respectively, of the panel sample reported engaging in these activities. This might have been due to the definitions used for these attributes. Respondents seem not to have found changes in 'days suitable' for these activities to be meaningful, possibly because most do not envisage, for example, swimming or kayaking on a river anything like 120 days per year. As a stakeholder surmised at a presentation of these results, respondents might have had difficulty envisaging scenarios that would reduce by a number of days the suitability of rivers for swimming and boating. Based on survey experience from the Hurunui River in Canterbury, describing the rivers as 'poor', 'fair', 'good' or 'excellent' for swimming and boating might have elicited a stronger response, especially if these were linked to water clarity and/or bacterial contamination (D Marsh, pers. comm.).

Over 40% of panel respondents reported swimming in the Waimea River and 23% in the Takaka River, so one would expect them to show some aversion to reduced suitability of these rivers for swimming. On the other hand, most residents of both areas have access to marine beaches within a 15 minute drive, so the number of days suitable for river swimming might not be a significant issue for them.

As for the attribute Boating, only 5% of panel respondents reported boating on the Waimea and Takaka Rivers and 6% on the Matakitaki, so the lack of WTP for changes in days suitable is less surprising. Worth noting is that a greater proportion of the public sample reported they participated in boating: Waimea (13%), Takaka (13%), and Matakitaki (22%).

The public sample included nine kayakers who were frequent visitors to the Matakitaki River (Figures 10 and 11), which influenced the results. The public sample WTP for a change from good to excellent for boating on the Matakitaki was $1,713 per household per year compared with $124 for the panel sample. This illustrates how over-representation can occur when particular groups respond to public calls for participation in surveys and highlights the need for random sample surveys when representative views are sought.

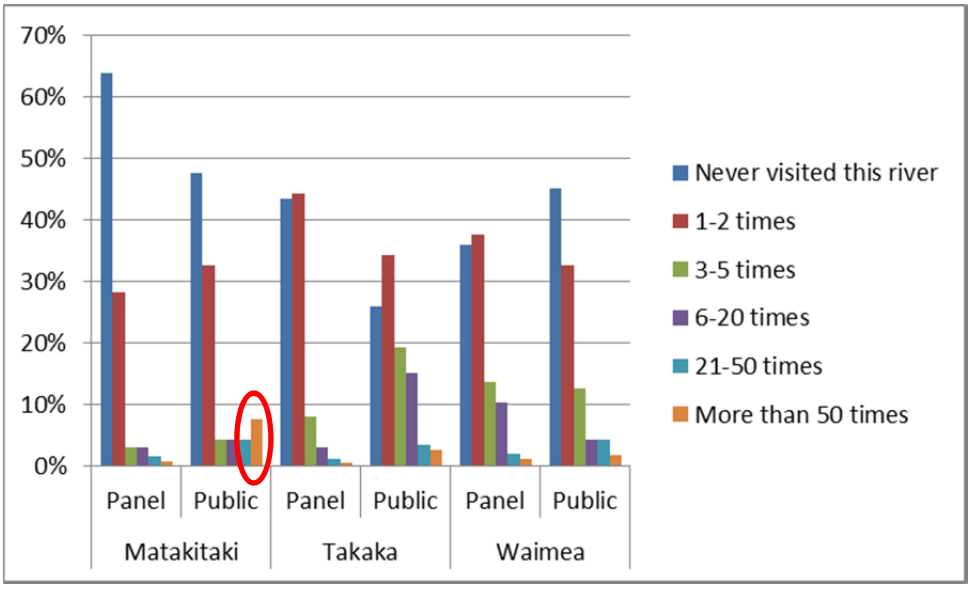

Figure 10. Number of times survey respondents reported visiting each river (panel *vs* public samples).

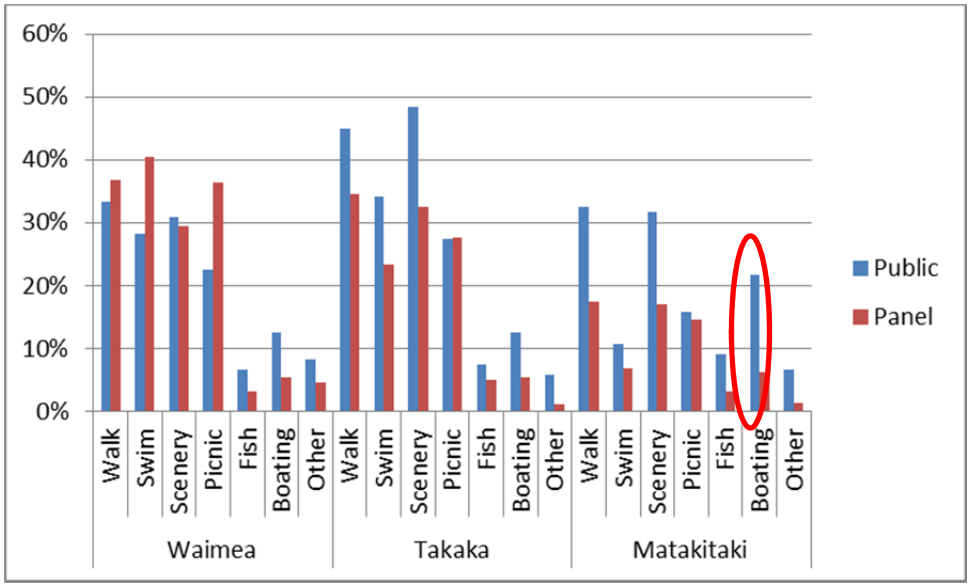

Figure 11. Activities undertaken by survey respondents, by river (panel *vs* public samples).

5.3.3. Aspects of Choice Modelling

Attribute definition and framing

How attributes are defined and described can influence responses to surveys, an issue known more generally as framing (Thaler & Sunstein, 2008). As noted above, defining the swimming and boating attributes in terms of days suitable might explain why these were not found to be significant for the three rivers in the Tasman survey. A VOW participant also questioned how the Natural Character attribute was defined, in

particular the assumption that 'highly modified' and 'mixed vegetation' are less preferred than 'all native vegetation'. Since farming involves modifying landscapes for beneficial outcomes, defining this as negative could be seen as influencing the results.

Some VOW participants also queried the colour-coding used in the survey form, in which conditions assumed by the research team to be preferred (more days suitable for swimming or boating, more jobs, better habitat for fish and fishing, higher taxes and more natural character) were given shades of green, and 'worse' conditions were given shades of brown. This was designed to facilitate respondents' analysis of choices and lighten the cognitive burden of considering text describing the levels of six different attributes. A VOW participant expressed concern about how this could influence responses, although they seemed to understand the rationale for colour-coding when it was explained.

Because framing is important, many studies use focus groups to identify the attributes of most interest to members of the community and how to meaningfully describe these attributes (Morrison & Bennett, 2004). For the Tasman study, the research team considered using the VOW workshop participants as a focus group for this purpose but decided against it because of other priorities for the early workshops and a desire to implement the survey in time to present results for the fourth workshop. Instead, the research team consulted with TDC staff and identified attributes and descriptors that were policy relevant and aligned with available RiVAS categories, since one of the objectives was to explore whether the survey results would provide a basis for comparing RiVAS rankings of different uses and values. In retrospect, for the choice survey results to be accepted and used by the workshop participants, they should have been involved in the attribute selection and definition.

Cognitive burden

In one sense, CM can integrate all of the major factors influencing choice into a single model and estimate relative preferences on comparable scales. By definition, this includes the value of both market and non-market goods and services and in that sense captures all components (*e.g.* direct, indirect, intrinsic, and option value) of what is sometimes called Total Economic Value (Pascual *et al.*, 2010).

However, only a limited number of attributes can be included before the cognitive burden becomes too great and survey respondents start ignoring some attributes. Ignoring an attribute in a choice survey does not mean that the respondent has no interest in that attribute, only that they are focussing on other attributes in choosing between alternatives. Further analysis suggested that the boat and swim attributes may have been ignored by most of the panel respondents (85% for the Matakitaki, 66% for the Takaka and 64% for the Waimea) (Bell *et al.*, 2012).

The software used to run the statistical analysis reports the proportion of unobserved influences affecting choice that have not been explained by the attributes, so it can assess how well the model explains the variation in the data (Hensher *et al.* 2008). While there are clearly other factors influences affecting choice for all three rivers, overall the models showed a high level of statistical fit with McFadden R^2 of between 0.29 and 0.33, which is equivalent to around 60% – 70% fit for a linear model (Hensher *et al.*, 2007, p 338). So even though most of the panel respondents appear to have paid little attention to some attributes, the models can account for a considerable amount of the variation in respondents' choices.

Willingness-to-pay

In choice experiments, preferences are usually estimated in monetary units as willingness-to-pay (WTP), but can also be expressed simply as relative preferences between attributes. VOW participants questioned whether respondents' choices in surveys actually reflect their true willingness to pay increased local taxes. It was noted that there is an annual public backlash over local rate (property tax) increases even when these are smaller than some of the WTPs reported in the Tasman rivers survey.

Respondents were reminded, however, that the indicated tax increases were for the river in question only, and that "there could be additional cost to your household if action is required to maintain or improve the condition of other rivers". And the WTPs estimated in this study, mostly between $50 and $200 per year, are comparable with those from other New Zealand studies. For example, Bell *et al.* (2009) found WTPs in a similar range for keeping a New Zealand lake free of an invasive weed and maintaining its natural biodiversity. A choice survey in Auckland estimated WTPs for improvements to various aspects of beach conditions ranging from $50 to $275 per household per year (Batstone & Sinner, 2010). Baskaran *et al.* (2010) found public WTPs ranging from $100 to nearly $400 per year for five years for improvements in environmental performance of vineyards in Hawkes Bay and Marlborough.

Nevertheless, many stakeholders and researchers alike are not comfortable denominating preferences in monetary units (Frame & O'Connor, 2011). This is especially so when estimates of monetary value are used to compare commercial and non-commercial uses, not to mention cultural meanings, of the environment by aggregating WTPs across a population to generate an estimate of the total value of a change in use.

Whose values to measure?

Having found differences between the panel and public samples for the Tasman rivers survey, this raised the question of how one should take into account diverse and divergent values. As a generalisation, the public sample WTP estimates were slightly higher on average and had a wider variance in responses. For example, as noted

above, the average WTP from the public sample (with kayakers over-represented) for improved conditions for boating on the Matakitaki River was more than ten times the average WTP of the panel, which was designed to be more representative of the wider community.

Some VOW participants noted that some groups are more strongly affected than others by a proposed development, and that there should be a way to take these views into account. Another participant responded that it is important to consider the views of the wider public, and that surveying a representative sample using CM seems one useful way to assess these. If the survey sample is representative, the views of more strongly affected parties are likely to be captured in a CM study. If they are only a small percentage of the community, their views will have only a small influence on the average result. Whether the views of such parties should be given additional weight is another matter and beyond the scope of this study.

5.3.4. Choice modelling as a decision-support tool

The aim of the study was to estimate relative preferences of the wider community for some prominent uses and values of Tasman rivers: swimming, boating, fish and fishing, natural character and as a resource to support economic activity and local jobs. However, because the rivers and their current uses are quite different, it is not possible to generalise about relative preferences for the different uses, and cross-river comparisons are also difficult.

Due to a range of concerns summarised above, the participants in the VOW workshops were not ready to use the results of the Tasman choice survey as an input for decision-making. Highlighting the issue of framing, one participant referred to choice modelling as “manufacturing consent” by virtue of how a survey is designed. As another participant put it:

> *The choice modelling survey is fascinating, but I’m not sure what to make of it.*
>
> VOW participant’s comment

Choice modelling is an evolving tool that requires specialist knowledge of welfare economics and econometrics. The professional integrity of the researcher is important as the design is easy to manipulate, particularly in the framing of choice questions. Compared with contingent valuation, which focusses on one attribute, CM is less prone to such biases and has characteristics that make it more appealing.

CM surveys appear most useful for policy decisions when specific intervention scenarios are under consideration, and less useful for spatial allocation decisions involving multiple resources, attributes and scenarios. They can perhaps be a useful input to stakeholder discussions, but for this to be effective the stakeholder group

should be involved in the design of the study and, in particular, the selection of attributes and how they are represented in the survey.

5.4. Social processes and social learning

The context in which we make policy for natural resource management has changed over the past 20-30 years. There are more stakeholders wanting a say, and inter-linkages between our social and ecological systems are becoming more apparent across a range of issues: *e.g.* biodiversity, fresh water management, climate change.

From a social learning point of view, many questions relate to how, or whether even, a shared understanding is being developed as an appropriate starting point for discussing differences. As Norton (2005) highlights, if the problem is not clearly defined , it is impossible to know what data is relevant. Discussion deteriorates into turf wars among sectors and disciplines, all promoting their particular data and analysis as definitive. In such discussions, the assumptions, knowledge and understandings that underlie the definition of resource problems are frequently uncertain and contested (Adams *et al.* 2003).

Accordingly, research challenges emerge around finding ways to make these different perspectives and assumptions more explicit. All the tools used in this project aim to do this, by helping people to better understand the decision-making process, and to communicate that understanding to others with different perspectives.

Seen in this light, these tools are just part of a wider process of social engagement although, in the past, they have been more often regarded as calculators that provide an answer in their own right. Tools and social process need to be looked at together. Some thought needs to be given to the general principles of engagement outlined earlier in this report (Section 3.4), which remind us to consider what we are trying to achieve with any particular process or tool. The principles provide the underlying protocols that support good relationships such as reciprocity and respect. And they prompt us to use engagement or facilitation experts to support these principles and facilitate the processes required to create a level playing field among stakeholders.

In addition, thought needs to be given to who is involved in the use of these tools, including their design and interpretation. If expert groups are selected to develop or use these tools, then in establishing these it is important to consider whose interests are likely to be favoured, and whose may be marginalised.

The questions in Table 6 cover four key aspects that build capacity for social learning. They can provide a useful check when setting up resource management decision-making processes or tools (Kilvington & Allen, 2009).

Table 6. Considerations when designing a public engagement process.

Participation and interaction	• Who is likely to participate? • Can spokespeople be found for interests that are commonly marginalised? • How can a level playing field be created? • What principles of engagement are important to this process and how can they be manifest?
Problem consideration	• Are there important underpinning assumptions that we need to clarify and examine? • How has the problem been defined and can we avoid being locked in too early to a way of seeing the situation? • How are people being supported to actively learn about the situation?
Institutional setting	• Are current institutional arrangements open and flexible to new ways of operating? • How can changes in what is known about the problem situation be incorporated in current plans/policies/approaches? • Can working outside formal processes achieve a better result in this situation and what would be needed to tie things back in later?
Systems thinking	• How can we improve understanding about the links and interactions across the system? • How can we bring together knowledge and information from different sources?

5.4.1. Social learning aspects of Visioning, RiVAS and Choice modelling

The aim of creating visions (development futures) or scenarios lies in taking a wider view of planning. Visioning is the process of getting any group of individuals, be they in a business, group or wider community or region, to focus on the same distant time horizon. It enables people to travel into the future to see and feel how various options could work, and their likely implications for the different groups and individuals involved.

Early steps need to ensure that participants have done some work on this in their different social, interest or sector groups. This provides some assurance that all parties are operating from the same capacity, and that they are committed to the process. Often we find that iwi and hapū have thought collectively about their future. According to one of the VOW participants, the horticulture industry has also developed a strategy for its future.

The ‘held values’ exercise in Workshop 1 was intended to ensure that participants are not just extrapolating current trends, and are really thinking about the deeper values (ethics, compassion, environmental quality, *etc.*) that they want to see reflected in freshwater management.

In contrast to the broad focus of Visioning, RiVAS assesses particular uses one at a time. A key underpinning of RiVAS is the relationship of the expert group to the Council and different sectors of community.

Care taken in selecting an expert group for a particular use, *e.g.* kayaking or irrigation, is important to provide some assurance among the key peer community that the outcomes are robust. Because these are done on a single use basis, these expert groups generally do not take other values into account. The boundaries between what is and is not included in the definition of a particular use are documented but can be confusing for those who have not been immersed in the process or read the reports.

People who have been involved in a RiVAS expert process usually explain that they learned a lot from it. This raises the possibility that the tool could be as important for education as for decision-making *per se*, by giving more stakeholders a framework for looking more closely at the elements that characterise freshwater uses and values such as biodiversity or irrigation.

Choice modelling can provide some insights to the preferences of the wider community. CM integrates across multiple attributes of a situation, resource or landscape, but it can only represent a limited number of these in a simplified way and responses can be influenced by survey design. It is likely to be most useful as a social learning tool when key stakeholders are involved in both survey design and interpretation of results.

6. INTEGRATION, PROCESS AND PARTICIPATION IN FRESHWATER PLANNING

6.1. Introduction

The practice of freshwater planning as it is currently framed by the RMA, and now more specifically by the NPS on Freshwater Management, involves setting standards and limits for water bodies based on the futures that the community wants, within some broad constraints. This implies a need to identify how diverse communities relate to and value freshwater and a process of deciding between uses and values when these cannot all be accommodated. Once decisions have been made, values and perspectives must be expressed in terms of concrete management parameters and objectives, even though these must be developed and selected using processes that risk disadvantaging certain members of the community.

This section considers how regional councils can acknowledge and provide for diverse values of freshwater systems through regional planning documents under the RMA. At the outset of the VOW project, the research team anticipated that the workshops would add more information to TDC's regional plan schedule on the uses and values of freshwater bodies and test some approaches for deciding between competing uses and values where it is not possible to accommodate all of them fully.

As it turned out, the workshops did not achieve that ambition, but did lead to some proposals for better recognising and providing for diverse freshwater values. These are discussed below, focussing in particular on how TDC's Schedule 30 might be structured to integrate more effectively the council's management of activities that affect diverse values concerning land, water and the coastal environment.

It must be stressed, however, that current practices that specify freshwater objectives using a limited set of (usually) biophysical parameters tend to empower certain voices and interests, and certain ways of seeing the world, over others. The last part of the section comprises a discussion of processes for enhancing the participation of those voices and interests that otherwise tend to be marginalised.

6.2. The role of regional plans and the TRMP

6.2.1. Targets and limits

A regional plan is a framework for decision-making that provides context, structure and direction for decision-making under the RMA to achieve long-term goals while anticipating changing circumstances and providing for unforeseen developments. These elements in turn increase consistency and transparency and hence provide certainty of outcomes for stakeholders.

Without objectives, policies and methods (including rules) in regional plans, every decision would be *ad hoc* and on its individual merits, with no agreed set of relevant issues, objectives or targets. In such a context, a council must rely on the general provisions of the RMA, under which it is difficult at best to manage the cumulative effects of activities. Managing cumulative effects depends upon setting targets or limits as the basis for managing activities whose effects individually are minimal and/or hard to monitor but collectively significant and visible.

Regional plans are most effective when they anticipate future pressures on the environment and specify objectives, policies and methods regarding these. For instance, if a council anticipates a significant increase in demand for lifestyle properties, its plan will be more effective in managing the resulting issues if objectives, policies and methods have been developed and stated before the council has to make decisions on an *ad hoc* basis.

Water allocation limits are a good example; a council notes increasing demand for abstraction from a water body, assesses existing and future uses and values for that water body, sets a limit on abstraction to provide for those values, and establishes robust methods to ensure allocation does not exceed the limit. It then monitors the effects of its policies and evaluates the extent to which objectives have been achieved, revising policies as appropriate. Although councils cannot always foresee the nature of future demand, they can anticipate to some extent which resources are likely to experience increasing demand, and set limits for these.

As noted in Section 5.2.3, these limits should not be seen as ends in themselves, but rather as thresholds of probable concern, *i.e.* a means to the ends expressed in the vision for a catchment.

6.2.2. Certainty and flexibility

The desire for regional plans to provide both certainty and flexibility was a recurring theme in the VOW workshops. Existing regional plans vary in the extent to which they look forward to future pressures and future states of the environment and the extent to which limits are specified and managed. Many plans describe issues in general terms and some describe quantitatively the outcomes sought by council. Few plans, however, link these outcome statements (goals) directly to rules and measurable standards. Probably fewer still do this in a way that provides clear strategic direction regarding the desired future of a catchment beyond the commonplace ‘maintain and enhance’ terminology. The more that future direction is indicated and linked to rules about permitted, controlled, discretionary and prohibited activities, the greater the certainty for both council staff and stakeholders regarding how consent applications will be assessed and the likely results of those assessments.

Abstractive users of water obtain certainty by securing a resource consent (usually for a period of 10-20 years and potentially up to 35 years), whereas instream users and the community can obtain a degree of protection for their uses and values through regional plan provisions, *e.g.* cumulative limits on water allocation and discharges, and prescribed environmental flows. The more prescriptive the plan provisions, the greater the certainty of outcomes but the less flexibility there is to accommodate unforeseen opportunities[19]. Conversely, the more general objectives and policies found in regional plans typically allow for discretionary activities; this provides flexibility but also reduces certainty, because applicants have less indication of whether their proposals will be approved, and because instream users can find that development gradually undermines uses and values not specifically protected by clear standards or limits.

In some circumstances, a council might opt for flexibility over certainty, *e.g.* where it has incomplete information on the full range of uses and values and hence prefers not to indicate which would take priority in the case of competing demands.

An example would be a catchment that has already experienced a moderate degree of development but still has some instream uses and values – of unknown significance – that could be at risk from further change. In such a case, the council could set limits that require proposals for further development to be assessed for impacts on other users. These other users would then need to make submissions on proposed consents if they were concerned these would adversely affect them. This could result in the documentation of significant uses and values to be recognised in the plan at the next review.

Note that, in the above example, if the council had good information about whether the other uses would be adversely affected to an unacceptable extent by further change, it could create more certainty for everyone by declaring the relevant activities, or their effects, as either permitted (if little or no adverse effect) or prohibited (if unacceptable effects). This could save all parties considerable expense by expediting applications or, conversely, signalling that applications should not be submitted because they are unlikely to succeed. In the absence of information, however, there is still a need for thresholds and limits to ensure human activities do not undermine or compromise important uses and values. Default thresholds can be used to avoid decline that would be difficult to claw back in the future, and these defaults can be tested through a consent process with provision for adaptive management.

[19] However, even where plans provide clear limits, developers can sometimes successfully apply for consent for a non-complying activity. A case in point is the Trustpower hydro-electric development on the Wairau River in Marlborough, where the Environment Court ruled that consent conditions were sufficient to meet the objectives in the regional plan, notwithstanding significant adverse effects on the natural character and angling values of the river. *Department of Conservation and Others vs Marlborough District Council* [2010] NZEnvC 403.

Resource users want some certainty around payback for investments; the bigger the investment, the longer the consent durations being sought. Proponents of big community water supply schemes, irrigation schemes and hydro-electric developments are particularly keen to secure longer timeframes. The more certain councils can be in setting limits to protect the uses and values of a given water body, the easier it is to provide for grant long-term consents for development projects.

6.3. How Schedule 30 works currently

As noted earlier, the Tasman Regional Management Plan (TRMP) includes Schedule 30 (Appendix 1), which lists significant uses and values of freshwater that may be adversely affected by reduced water quantity, and is linked to policies and rules about water allocation. For example, Policy 30.1.3.15 sets a default allocation limit of 10% of the 5-year, 7-day low flow for rivers with regionally or nationally significant aquatic habitat value as identified in Schedule 30. The next policy, 30.1.3.16, provides scope for allocating more water from rivers without significant aquatic habitat value as identified in Schedule 30.

VOW workshop participants noted that Schedule 30 is incomplete in that it only lists some values of some freshwater bodies. In addition, only some water body values are assigned levels of relative significance – and the Schedule only currently applies to water allocation issues. Schedule 30 is not currently linked to TRMP provisions about land use, water quality, activities on the beds and banks of rivers (*e.g.* flood control and gravel extraction) or coastal management.

A regional plan can never include all uses and values for all freshwater bodies in a region, but rather a council should aim to identify in its plan those values most at risk and those it considers most relevant for setting management objectives and considering consent applications. Though this has yet to be tested, it may be that managing for a subset of uses and values will in practice provide for many others, and that the remaining ones can be dealt with on an *ad hoc* basis.

The need to consider consent applications, and therefore costs to both applicants and affected parties, can be reduced where specific objectives are clearly stated in the plan. Uses, values and objectives can be reviewed periodically as development occurs, as adverse effects are addressed or as community values change.

6.4. A possible new structure for Schedule 30

6.4.1. A framework for more integrated management

In discussing what Schedule 30 might aim to achieve, VOW participants noted tension between simplicity and detail, holism and reductionism, and flexibility and certainty.

For each of these continuums, a council seeks to determine how to best achieve the community's long-term goals, *e.g.* to provide a reasonable amount of certainty for both instream and consumptive users without unduly constraining the council's ability to respond to changing circumstances or innovative and sustainable proposals.

VOW participants considered whether Schedule 30 should guide TDC decision-making in other parts of the TRMP, *e.g.* discharges and activities on the beds and banks of rivers as well as water allocation. For instance, if a proposed discharge, addressed by Part VI of the plan, had the potential to adversely affect significant values of tāngata whenua, linking discharge rules in the TRMP to Schedule 30 would be a logical way to ensure that the affected values were given due consideration.

This approach was tested, and generally supported, by VOW participants in the case study exercise of the proposed Motupiko storage scheme in Workshop 5. Table 7 shows the structure of Schedule 30 for the case study. After working with the case study in Workshop 5, participants were asked how well the proposed structure (displayed in Table 7) worked for them, what they did not like, and what would make them confident in the framework being used for decision-making. Their responses are summarised in Box 2.

There was also discussion about whether development values should be excluded from Schedule 30. While this was not fully resolved, one participant noted that TDC already reserves water for Māori lands (*i.e.* an aspirational priority). It was noted that aspirational values can be recognised in the Vision and in management objectives.

Finally, it was noted that Schedule 30 is a way to give effect to the NPS on Freshwater Management, *i.e.* to document and give effect to the objectives and limits that are set by the Council and the community.

The project team took the feedback as a general endorsement for an integrated structure for Schedule 30, noting the various suggestions for how it could be made more useful. It is recommended that Schedule 30 be expanded to link to all TRMP chapters that deal with land, water and coast and that, as far as possible, it include management objectives that specify how and to what extent the various uses and values will be provided for.

By including a vision statement and objectives for each catchment, Schedule 30 can help integrate policies across the TRMP. It could identify how the various policies and methods fit together for a given catchment and might in fact highlight inconsistent objectives or policies that require the council's and the community's attention. Such a schedule would be used by consent applicants and other stakeholders to look up in one place the values that might be affected by existing or proposed activities. The Schedule would then direct them to relevant rules to see if a resource consent is required and what conditions applicants would need to meet.

Table 7. Possible new format for Schedule 30 in the Tasman Resource Management Plan (TRMP). Note: Highlighted text is hypothetical and purely illustrative; other text reflects existing content of Schedule 30 or ` content from existing objectives in other parts of the TRMP.

			Relevant section of the TRMP				
Water body		**Water Body Uses and Values**	**II: Land use**	**III: The coast**	**IV: Beds and banks (Morphology)**	**V: Water quantity**	**VI: Water quality**
Motueka Catchment (including rivers, streams, wetlands, connected groundwater, and catchment impacts on the Coastal Marine Area)	**Vision for this catchment:** *The Motueka catchment will be an ecologically healthy, productive landscape that provides for people's cultural, social and economic well-being. It is managed for both dryland and irrigated food and fibre and related primary production and processing, renewable energy production except dams on the main river, and river water nutrient, sediment and pathogen levels less than or equal to 2008-10 averages as measured at Woodstock, while protecting 2011 levels of natural character, native fish and bird diversity, recreation, trout angling opportunity, and coastal values, as well as indigenous species and ecosystems on which a healthy functioning catchment depends. Based on current catchment land uses, this vision corresponds approximately to an equivalent human population of 100,000 people.*					
Motueka River (headwaters in the Red Hills to its mouth at and into Tasman Bay)	Ecological	▪ Natural character - Outstanding ▪ Native birds - National significance ▪ Native fisheries – regional significance		▪ Maintain ecological functioning of Tasman Bay as affected by Motueka River plume	▪ Maintain native bird and fish habitats (including for eels), fish passage, trout habitats and braided and lowland river systems (see Part IV)	▪ Quantity, level and flow maintained in natural state (Water Conservation Orders (WCO) ▪ Protect instream values, including native fish	
	Instream (human)	▪ Salmonid angling – National significance ▪ Swimming - Regional significance ▪ Kayaking - Regional significance • Cultural, spiritual, landscape and iwi values, including food gathering, *e.g.* watercress • Contribution to Tasman Bay – recreation, fisheries, aquaculture etc	▪ Land use does not cause excessive sedimentation of the river bed (WCO) ▪ Maintain and enhance the natural character of the margins of rivers, and protect it from adverse effects of subdivision and use of that land (Chap 8)	▪ Maintain coastal productivity of Tasman Bay as affected by Motueka River plume ▪ Maintain water quality suitable for aquaculture harvest 90% of the time.	▪ No dams that restrict passage of trout or adversely affect trout spawning ▪ No changes to morphology	▪ Quantity, level and rate of flow maintained as per WCO	▪ Water quality maintained for trout fishery as per WCO [*e.g.* N ≤ 4 mg/l] ▪ Maintain water quality for contact recreation (Schedule 36A)(see also 33.1.3.11) ▪ During base flows: o E. coli < 100/100ml and o Water clarity > 3.5 metres
	Consumptive	▪ Domestic, Industrial and Community water supply ▪ Irrigation – Regional significance ▪ Gravel and sediments ▪ Stock water supply				▪ Maintain and improve existing water users' security of supply to acceptable levels	▪ Maintain water quality for irrigation (Schedule 36A) (see also 33.1.3.11)
	Other	▪ Nutrient cycling and assimilative capacity ▪ Flood capacity ▪ Small scale hydro		▪ Maintain littoral zone processes affected by Motueka River discharges	▪ Maintain bed andbank stability and flood carrying capacity ▪ Provide channel capacity for 1 in 10 year flood.		
Alluvial groundwaters of the upper Motueka River	Ecological	▪ Contribution to spring flows ▪ Contribution to rivers					
	Consumptive	▪ Domestic use ▪ Stock water ▪ Irrigation ▪ Community water supply ▪ Industrial water supply				▪ Maintain supply for households and stock ▪ Maintain water users' security of supply	
Motupiko River	Ecological	▪ Native fish - Regional significance	▪ Protect instream values, particularly trout and native fish	▪ Maintain water quality to meet needs of aquatic ecosystems (see also 33.1.3.11)	▪ Maintain indigenous bird and fish habitats, fish passage, trout habitats and braided and lowland river systems (Part IV)		
	Instream (human)	▪ Contribution to Motueka trout fishery ▪ Swimming - Regional significance	▪ Maintenance of flows for trout spawning and fish	▪ Water of sufficient quality for fish passage and	▪ No dams that restrict passage of trout or	▪ Land use activities do not cause excessive sedimentation of river	

			Relevant section of the TRMP				
Water body		**Water Body Uses and Values**	**II: Land use**	**III: The coast**	**IV: Beds and banks (Morphology)**	**V: Water quantity**	**VI: Water quality**
			passage in tributaries during May to October (WCO) (the order provides specific flows (also included in schedule 31C) plus allocation limits in Figures 31.1E and 31.1F.)	trout spawning from May to October	adversely affects trout spawning ▪ No changes to morphology	bed ▪ Maintain and enhance the natural character of the margins of rivers, and protect it from adverse effects of subdivision and use of that land (Chapter 8)	
	Consumptive	▪ Irrigation ▪ Domestic water supply ▪ Stock water supply ▪	▪ Maintain and improve existing water users' security of supply to acceptable levels. ▪ Maintain minimum flows for stock and domestic water supplies ▪ Protect future access to water for community water supply (schedule 31D??)	▪ Maintain water quality for irrigation (Schedule 36A) (see also 33.1.3.11)		▪ Protect land with high productive potential from fragmentation (Chapter 7)	
	Other	▪ Small scale hydro-electric power generation ▪ Nutrient cycling and assimilative capacity ▪ Flood capacity			▪ Maintain bed and bank stability and flood carrying capacity (Part IV)		

Box 2. Feedback from VOW participants after using proposed integrated structure of Schedule 30 to assess a hypothetical storage scheme on the Motupiko River.

What aspects of Schedule 30 did you find useful?

- Liked the logical sequence
- Useful but only a tool
    - assuming comprehensive Schedule 30,it does give a sense of Vision
    - decision-makers also have defined responsibilities under RMA
- Benefit in that it attempts to define boundaries, provides objectives and certainty
- Provides structure for setting of limits, including sub-catchment specifics
- Checklist aspect was useful as it got discussion going
- Whole catchment vision useful, and also provided for sub-catchment effects.

What created most problems for you?

- Schedule 30 restricts – we should think beyond this
- Land use and landscapes are different things, better to treat them separately as per the RMA, *e.g.* s.6 matters of national importance
- When filled out, Schedule 30 will have a lot more data – may need to be crunched into specific criteria for decision-makers – or use set of values that can be symbolic of multiple values
- The vision statement was an expression of the status quo i.e. not an aspiration
- Is the monitoring site used in the example appropriate for the implied location and scales of governance?
- Not useful to generalise another statement/rule (*e.g.* water conservation order)
- Doesn't help maintain natural state waters without a water conservation order
- Scale – what is 'natural'? Trade off across catchment/s?
- No clear connection to land use
- Decisions like this *alter* future decision-making environment (*e.g.* dams store water for irrigation – so can expect future uses will change)
- Schedule 30 lacks specifics around effects
- Things from Freshwater NPS are not in Schedule 30.

What would make you confident in this framework being used as a basis for decision-making?

- Some activities could be permitted or controlled if all matters in Schedule 30 are addressed
- Enable positives to offset negatives, i.e. where someone is actually adding value to achievement of the Vision
- Needs to be accessible and useful to applicants
- Schedule should include 'actuals', it is not the place for 'potentials'
- Put in land uses (*e.g.* food and fibre).

Other ideas

- Use list of missing values identified in Workshop 2 to develop a 'master list'
- Could use 'importance' as a filter rather than 'significance', which has particular RMA connotations
- Differentiate 'actual' values from 'aspirational' values.
- May be necessary to condense values/uses into some symbolic or representative value – *e.g.*, use of trout habitat to represent other natural ecosystem values.

6.4.2. The issue of scale

In the suggested new format of Schedule 30 (Table 7) the left-hand column contains the names of the water bodies in the region. These would correspond with the way that the Council identifies water bodies for freshwater management purposes. That is, in the Tasman District, large catchments such as the Motueka River are divided into zones (*e.g.* upper, middle and lower), although it is essential to remember that achieving objectives in the middle and lower catchment (and the coastal environment) will depend upon what occurs upstream. Areas with many small rivers that flow to the sea, *e.g.* the west coast of the Tasman District and Abel Tasman National Park, are clustered and treated as one for assessment purposes, on the assumption that the water bodies are reasonably similar. At present, TDC has defined its water management zones in terms of managing water flows and levels, *i.e.* quantity. It might need to reconsider whether the same zones and clusters are the most appropriate for managing the full range of issues that would be spanned by the TRMP parts envisaged to be linked to an expanded Schedule 30.

For each such management zone or cluster, the Schedule would indicate the highest level of significance of each value present in the catchment. For example, if a catchment has some highly significant native fish habitat in one or two tributaries, and less significant native fish habitat in others, the Schedule would indicate that the relevant management zone has 'highly significant native fish habitat'. Using an electronic map interface, a user could then 'drill down' to identify in which sub-catchment or reach the fish habitat is, its significance and the corresponding management objectives at that level. Land and water users could then refer to rules in the plan to see whether, and if so how, this affects their proposed activities.

Such a summary table could also help the council to identify how and where to prioritise various uses and values, *i.e.* what its management objectives should be for different catchments and zones in light of the distribution of uses and values across the region. The original plan for the VOW workshops was that a discussion of this nature would take place in the later workshops and produce management objectives for some water bodies. However, the workshops did not get this far. Section 7 discusses how TDC might provide a context for this discussion.

6.4.3. A holistic vision

As shown in Table 7, the reformatted Schedule would include a vision statement[20] to indicate in broad terms the desired future for each catchment. In the context of

[20] In terms of the usual RMA framework of objectives, policies and methods, a vision statement could also be described as a 'broad or overall objective' for a catchment, while the 'management objectives' referred to in this report are more detailed statements of the environmental outcomes sought in terms of particular uses and values or one or more indicators that reflect a water body's suitability for particular uses and values. See also the discussion in Section 5.2.3 about limits as 'thresholds of probable concern'.

catchment planning via the TRMP, vision statements that are holistic and focus on broad outcomes would complement the other, more specific, content of Schedule 30. For example, assessments of significance using RiVAS are largely reductionist, *i.e.* they simplify complex concepts to fit within more easily described categories or frameworks. As such, they may not adequately reflect Māori cultural values and approaches to resource management, broader landscape character, or community aspirations for development. Thus, vision statements and RiVAS assessments can usefully complement each other by each meeting distinct information needs.

As discussed in Section 5.2, for visions to be useful in planning practice, they need to be translated into specifics. This might have some parallels with the more directive approach to planning that New Zealand experienced under the previous Town and Country Planning Act, and recent spatial planning initiatives in New Zealand and overseas (Gardner-Hopkins and Fairgray, 2011). The intent is to ensure that regional plans provide meaningful direction and guidance for council decision-making, *e.g.* on resource consents, rather than leaving broad discretion with no clear indication of what the community wants.

Apart from vision statements, another possible response to the call for more proactive planning is to try to specify management objectives for all uses and values the council seeks to provide for in a given catchment. It is not possible to address every use and value for every water body, however, so councils must take a more pragmatic approach, *e.g.* by identifying standards for certain parameters that, if achieved, will provide for most uses and values.

In practice, neither approach on its own is likely to capture adequately all the matters to be taken into account. The approach recommended here therefore combines these two approaches and suggests that both visions and specific management objectives and limits be included in Schedule 30. It is likely to take some trial and error for councils to find an appropriate level of detail in vision statements, and this could vary from one council to the next.

Vision statements could be developed through a community-led process or drafted by the council for public input. In either case the vision statements would be notified for submissions and hearings before they would become part of the regional plan.

6.4.4. Freshwater uses and values

In the suggested structure for Schedule 30, uses and values would be listed by group: ecological (primarily aimed at native flora and fauna and natural character), human non-consumptive (*e.g.* kayaking, swimming, amenity and cultural), and consumptive (*e.g.* irrigation, water for domestic use). Grouping in this way facilitates the presentation of management objectives in the remaining columns, since multiple ecological uses will tend to be served by similar management objectives, and so on.

A category of 'Other' includes uses and values such as flood control and small-scale hydro-electric power generation that do not fit well in either consumptive or non-consumptive. Hydro-electric power generation would normally be considered consumptive because it removes energy from a river and often changes the flow regime significantly, although small-scale run-of-river schemes could potentially be grouped with human non-consumptive uses. Similar considerations apply to flood control measures, which can affect other uses and values substantially but do not always do so. While angling and eeling might be considered consumptive in that fish are sometimes removed and eaten, and because salmonids can impact native fish populations, management objectives for these uses are generally aligned with other instream non-consumptive uses, so pragmatism suggests that is where eeling and angling are best placed.

Ultimately, how different uses and values are grouped in the Schedule does not pre-determine how they are managed or what priority they receive – it is only a matter of presentation for ease of use in terms of grouping uses and values that are likely to be addressed by similar management objectives.

6.4.5. Adding uses and values and assessing significance

TDC has previously invited people to submit information on uses and values in addition to those currently listed in Schedule 30, and could do so again.

To be added to the Schedule, a use or value would generally need to be of local or greater significance, *i.e.* important to a community rather than just a few people, based on available and verifiable evidence (*e.g.* surveys, reports, and evidence of experts and staff, stakeholders or submitters). Hence, some generic criteria would still need to be developed for assessing this threshold for a wide range of uses and values. To encourage consistency of terminology, uses and values could be described using one or more category from a standard list, although a category of 'other' would always be needed to avoid imposing categories on people.

There are various ways that significance of a use or value can be assessed. Indeed, Chan *et al.* (2012) advocate "a multi-method and especially multi-metric approach" and mention the possibility of using choice surveys and constructed metrics to assign "value, ordinal ranking or numeric tag to what are in large part intangible properties".

One option consistent with this suggestion is an expert panel using RiVAS methodology, for which criteria and metrics have been developed for nine uses and values and can be developed for other uses. Other recognised assessments could also be incorporated, *e.g.* from a Water Conservation Order (WCO). As Chan *et al.* (2012) stress, however, it is important that these be recognised as telling only part of the story, and to be open to other methods of describing the ways that freshwater systems matter to people.

Someone submitting information to support an assessment of significance for a use or value in one catchment would be encouraged to provide information for other catchments as well, so that their relative significance can be assessed. Information used to support any inclusion would be made available to the public except where valid reasons exist for withholding it (*e.g.* where it pertains to *wahi tapu* - sacred sites).

As noted in Section 5.1.3 above, some VOW participants commented that Schedule 30 does not acknowledge the benefits of primary production, and suggested that a RiVAS method could be developed for food and fibre production, for example. Whether the significance of primary production is represented through a vision statement, assessed significance using RiVAS or some other mechanism, decision-making will be improved if councils have a rigorous and consistent way to assess the significance and contribution of land use to community aspirations. It is also important to bear in mind that the effects of a particular land use will vary depending on the local environment and management practices. When councils are determining management objectives and priorities, the benefits of activities that have adverse effects on instream uses and values, or compete with other extractive uses, need to be considered.

6.4.6. Standards

While we recommend that management objectives would be a central feature of Schedule 30, detailed numeric standards, flow regimes and other limits as required by the NPS for Freshwater Management would be in a separate table, *e.g.* much as Figures 31.1.E and 31.1.F in the TRMP now provide allocation limits for water bodies. To reduce the need for the Schedule and associated tables to specify standards and limits for every water body, the TRMP could provide minimum or default standards for all catchments, such as the TRMP's default allocation limits (at 30.1.3.15 and 30.1.3.16), for catchments not covered by specific flow provisions. (See also TRMP 33.1.3.11 and 33.1.3.12 for the beginning of default water quality provisions that link to Schedule 30.) Default provisions apply only where specific standards have not been determined for a given water body. As demand increases and default limits are reached for a given resource, the TDC's approach is to undertake a more detailed analysis to determine the appropriate limits for that water body.

Minimum or default standards would be based on an agreed set of uses and values for all catchments and could be linked to a water classification schedule that lists standards for water bodies being managed for specific uses.

Objectives and policies specific to certain water bodies could be implemented through rules that classify various activities as permitted, controlled, discretionary or non-complying based on the significance of the other uses and values of that water body. Significance assessments might also be used to develop appropriate water quality or

quantity thresholds and they might guide decisions about works and services provided by the Council.

6.5. Using Schedule 30

6.5.1. Setting priorities

Where existing and desired (aspirational) uses and values for a given water body cannot all be accommodated, councils require a process or method to determine management objectives. For example, how much flow should be made available for irrigation, how much for hydro-electric power generation and how much for instream uses, or should a river have a more natural flow regime to maintain ecological, cultural and amenity values?

In some instances, TDC has water quality policies that indicate what will receive priority. For example, the TRMP includes policies to implement the Motueka WCO, which accommodates a range of uses and values through a flow-sharing formula. It also has policies for rivers where stock drinking or swimming water quality is not met, which will also guide decisions about where to target council works and services.

The issue here is how far the TRMP (and Schedule 30) would go in specifying management objectives and, in particular, specifying which uses and values will get priority where they are not all compatible. The more specificity in the TRMP, the more certainty there will be for the community and the council, *e.g.* it will be clearer to both applicants and council officers whether a consent application to take from or discharge into a river would be approved. Specific management objectives also clarify where urban or rural land use activities need to be managed differently because they have adverse effects that prevent the council from delivering on the community's aspirations.

Setting priorities is facilitated by information about how water bodies are used and valued by the community, including aspirations for development and/or restoration, so that these can all be taken into account. Note, however, that it is not the existing value per se that matters, but rather how and how much the value (or significance of a use or value) would change if the freshwater body were used or managed differently.

Characterisation and valuation of ecosystem services can help to inform deliberative democratic processes to set community priorities for competing uses and values (Chan *et al.* 2012). Given the diverse ways that freshwater systems matter to people, it is likely that multiple methods of eliciting and characterising these uses and values will be required. Many have argued that some classes of value are incommensurate with others, for example some principles are so deeply embedded in a person's or people's identity that they are considered sacred and not available to be balanced with other considerations (*ibid.*). Where such principles are widely held or

acknowledged by the community, they can help define so-called 'bottom line' standards. But there is no simple method of balancing to determine the best or optimal management objectives for a freshwater system; ultimately this must be decided through a democratic process.
The gathering of information to assist and inform the democratic process, of course, is subject to council decisions about work programmes. For example, the TDC's next major water review will involve the Takaka River catchment (M-A Baker, pers. comm.). This is an opportunity for further development of Schedule 30, as well as a process of using State of the Environment monitoring data to identify where existing freshwater management objectives are not being met. As well as evaluating performance against existing objectives, the coming review would be an opportunity to develop a vision statement and a hierarchy of goals, objectives and limits for the catchment that integrate across the various parts of the TRMP. In any case, further development of the Schedule will be subject to public consultation processes.

6.5.2. Policies for using Schedule 30 as a dynamic tool

Schedule 30 might never include all significant uses and values for all freshwater bodies in Tasman District or have specified a complete set of management objectives for every catchment. Even if it did, these would need to be periodically reviewed, because the relative importance of uses and values can change over time as technology and society change.

As noted above in Section 4.6.3, there were differing views amongst VOW participants about whether Schedule 30 should be used while it remains an incomplete listing of uses and values. Our view is that some information on the significance of some uses and values is better than no information. As the TDC acknowledged in proposing new text for Chapter 27 of the TRMP, the plan needs to include guidance on the use of Schedule 30 especially "where there is incomplete knowledge or uncertainty about a particular value or its significance" (TRMP, 27.7.1). The proposed text says that TDC will take into account, when considering proposed activities on the beds of rivers and lakes, uses and values listed in Schedule 30 as well as other uses and values not yet identified but likely to be present.

In the same way that Schedule is used in the TRMP's Chapter 30 to guide default water allocation limits, the TRMP could refer to Schedule 30 in Chapter 27 (and other chapters) to guide default standards and limits. For example, a new policy could be added to the TRMP stating that, as a default position, the TDC would as a matter of priority provide for, at their current level, uses and values that have been assessed as having national or regional (or high or medium) significance. Activities that are inconsistent with maintaining these uses and values would be either discretionary or non-complying activities in terms of the plan and would require resource consent.
In many cases, the Council is likely to have good information on the range of uses and values for particular water bodies, sufficient to indicate that catchment-specific

provisions would better meet the needs of the community and the RMA's overall objective of promoting sustainable management. For these water bodies, the TRMP would state specific standards or limits, which might be higher or lower than the default standards. And in any case, the management objectives for a catchment would be reconsidered when the Council conducts a review of a given area, such as that planned for the Takaka River catchment.

In addition, the Council could consider whether any controls on currently permitted or consented activities (*e.g.* land use intensification, permitted takes and discharges, *etc.*) would be required to avoid inadvertently giving priority to certain uses and values over others. For example, both in Tasman District and New Zealand more generally, the state of some water bodies and their ability to provide for instream uses and values such as native species, angling and swimming, have declined due to permitted urban and rural activities (Office of the Auditor General, 2011; Young *et al.*, 2010) even though decline was not the council's intent. The result is that the option of protecting (*i.e.* restoring) these instream uses and values at their previous level is now either very expensive or simply not possible. The suggested structure for Schedule 30 in Table 7, is intended to make it easier to identify where activities managed under one part of the TRMP are putting at risk the achievement of objectives under another part.

Water bodies with slow flushing rates, such as lakes, wetlands and coastal lagoons, are likely to be more vulnerable than rivers to irreversible change due to cumulative effects. These water bodies would be an appropriate initial focus for council's consideration of whether permitted activities are likely to jeopardise the maintenance of uses and values that the community wants to protect.

6.5.3. Potential for development or restoration

As noted above, for decision-making purposes it is not so much the existing value or significance that matters, but rather how and how much the value (or significance of a use or value) would change if a freshwater body were used or managed differently.

To date, most significance assessments using RiVAS have been based on existing condition and use (Hughey and Baker, 2010b); there is also a need to recognise potential for enhancing the uses and values of freshwater resources. This includes the potential for rehabilitation or restoration of natural values, including where monitoring shows that existing water quality standards are not being met, as well as the potential for hydro-electric power generation or increased production of food and fibre.

A recent extension of the RiVAS methodology (Hughey *et al.* 2011) provides for this kind of assessment; it indicates where in a region there is the largest potential to enhance a given use or value. For kayaking in Tasman District, for instance, the application of this extended method indicated that the best potential for enhancing

kayaking is on the Lee River, based on an enhanced summer flow regime from a water storage dam currently under consideration (K Booth, pers. comm.).

The RiVAS assessment for irrigation in Tasman District already incorporates potential value to an extent, so that assessment could be revisited to distinguish between existing and potential significance of irrigation in various catchments.

Where an issue concerns only a single water body, such as a river reach potentially affected by development, there is more scope for considering several potential scenarios and how each would affect various uses and values. This is often done in preparation for consent hearings for major project, for instance.

How might 'potential value' be incorporated and used in a regional plan such as the TRMP, prior to determination of management objectives? A use or value with significant potential for enhancement or development could be noted in the Schedule and taken into account when setting a vision, management objectives and priorities for catchments. This could then trigger, at catchment review, an analysis of options for the water body in question and be addressed in the plan in some cases through rules and in other cases through council services, incentives, education and/or advocacy depending upon the nature of the potential value and the interventions required to realise it.

Another option would be for potential significance to be recorded in the plan in a manner that triggers a consent requirement for a discretionary activity, in much the same way that land can be protected for future development through statutory designation. However, this could generate uncertainty and would probably be unhelpful if there were many such flagged uses and values in the regional plan, so this mechanism should be reserved for high priority restoration and development objectives only.

6.6. Process and participation; enabling other voices

TDC's Schedule 30 is one example of how a regional council can attempt to recognise and provide for New Zealanders' diverse freshwater uses and values. The preceding discussion describes how such a schedule can integrate across a range of activities that affect multiple water bodies. A vision statement could provide a broad, aspirational direction for a catchment while more detailed objectives would provide measureable standards to achieve a desired level for specific uses and values and/or serve as "thresholds of probable concern" for the broader vision (see Section 5.2.3).

In Workshop 5, VOW participants made suggestions regarding how Schedule 30 could be further developed. These can be summarised as follows:

- Use other consultation opportunities (*e.g.* a roadshow to report on freshwater monitoring) to mention Schedule 30 and how it affects decision-making, and highlight how people could be involved.
- Engage with sector and interest groups over their values, and amend Schedule 30 accordingly.
- See Schedule 30 as an empowering tool for community discussions; seeding ideas like this takes time.

The process of documenting and assessing specific uses and values raises a number of issues (Tadaki & Sinner, submitted; see also Section 5.1.3), of which two are particularly important here:

- The selection of categories of uses and values for assessment and inclusion will tend to favour organised groups with specific uses over people with more aesthetic, social or cultural attachments to freshwater that are difficult to reduce to indicators of suitability for a certain activity.
- Most members of the community have little or no understanding of how the RMA plans work and/or are not comfortable with the process of making a submission to the council.

Both situations call for councils to think more broadly about how they engage with members of their communities.

6.6.1. Visions as an enabling mechanism

To be more inclusive, a council's consideration of objectives, policies and methods for freshwater bodies can seek to empower voices that tend to be marginalised by the RMA process, which tends to focus on discrete and measurable uses and values rather than more holistic perspectives. Incorporating in the regional plan a vision statement for each catchment is one way to address this need. Visioning invites people to describe their desired future in terms that have meaning for them, not just as objectives and standards for categories of uses and values that have been defined by someone else, however useful these might be.

The Motueka Integrated Catchment Management (ICM) research programme utilised a range of innovative techniques for giving voice to perspectives and interests that are not typically forthcoming in RMA planning processes (Allen *et al.* 2011). These techniques included Watershed Talk, a series of discussions in which catchment residents were invited to talk about a photograph that had meaning for them, and Travelling River, an art-science exhibition about the Motueka River that also used photography to express diverse ways that the river and its landscapes matter to people (Atkinson *et al.* 2004; Atkinson *et al.* 2009; Kilvington *et al.* 2011a).

While techniques such as these require time and resources, if managed well they can reveal more complex relationships between people and the environment than do traditional planning processes. However, as discussed earlier (Section 5.2), it will still be necessary to reconcile and translate diverse desired futures into a coherent vision that has practical meaning for resource management. The zone committee process being utilised for the Canterbury Water Management Strategy provides a collaborative governance model for how this might be done (Canterbury Water, 2012) as does previous work by some water user committees within Tasman District.
At the same time, there is a need to recognise that collaboration can in practice work to benefit existing interests rather than expand democratic decision-making. There is an emerging field of literature that highlights risks inherent in collaborative approaches to governance, including further marginalisation of weaker actors (Kallis *et al.* 2009; Lemos & Agrawal, 2006; McGuire, 2006; Shilling *et al.* 2009; Swyngedouw, 2005; Tadaki, 2012).

6.6.2. Scale revisited

One lesson from the VOW workshops is that working at the scale of the entire district is problematic, even though in principle regional planning should encompass as wide a scope as possible to keep everything in the wider context. That is, in a perfect world a regional council would set objectives for all uses and values in all freshwater bodies as part of a single process, so that all interactions and dependencies could be taken into account. In reality, however, this scope is too wide for meaningful stakeholder engagement, and the information set will never be complete anyway, if only because it is always changing.

The catchment would seem a more tractable scale at which to consider both aspirational visions and detailed policies and objectives for freshwater management. Catchments will not align neatly with communities of interest, of course.
Many stakeholders have interests that transcend catchment and even regional boundaries, but they can draw upon their expertise and wider information to bring this wider context to the catchment discussions. For example, in considering the extent to which salmonid angling will be provided for in a particular river, stakeholders and councils can consider how well angling is provided for in other local rivers, and how much the competing values are provided for elsewhere. Schedule 30 as populated by RiVAS and other tools would assist in this regard.

6.6.3. In summary

A schedule of freshwater uses and values, with associated visions and objectives, can help to integrate a range of considerations in a regional plan and thereby address cumulative effects of land use and other activities. For it to reflect the aspirations of the wider community, a council will need to enable voices and perspectives in addition

to those interested in specific ‘uses and values’ that conform to predetermined categories. Some of these perspectives can inform the council’s vision for a catchment, while other perspectives may be more relevant for other council processes, such as the long-term Council Community Plan that guides council expenditure for a 10-year period.

A schedule of freshwater uses and values will only ever be but one of the ways a council listens to and responds to its communities of interest. But it can provide clarity and certainty for decision-making, and thus more consistency and greater likelihood of achieving the aspirations of the wider community.

7. LEARNINGS AND RECOMMENDATIONS FOR FURTHER RESEARCH

The aim of this project was to explore how people think of 'freshwater values', how these values can be incorporated in regional council planning for freshwater and, in particular, how tools such as the River Value Assessment System (RiVAS) and choice modelling (CM) can assist in achieving this. The project involved a case study based on a schedule of uses and values in Tasman District Council's (TDC's) regional plan (Schedule 30) that the Council wanted to develop further.

The project considered a number of matters, in roughly the following order:

1. Understanding concepts of value and values, and the national and local context of freshwater planning
2. Exploring RiVAS and other perspectives on identifying and assessing values
3. Trialling ways to document the range of values in specific catchments, to include in a regional plan
4. Considering visioning as a way to express more holistic aspirations in regional plans
5. Considering CM as a tool to complement RiVAS and other methods for eliciting and assessing values
6. Trialling a new framework for recording and using values for decision-making.

As described in Section 3, the project centred on discussion and learning amongst the research team, benefiting from each other's experience and disciplinary perspectives and stimulated by the dialogue with the Valuing our Waters (VOW) workshop participants. There was no attempt to reach explicit consensus among the participants on any of the matters discussed. Thus, the conclusions reported here are those of the research team, informed by the workshop discussions but not necessarily shared by all participants.

7.1. Concepts of value and values

Values represent complex concepts and are not easily defined.
In contexts where it is important to be rigorous and clear, it can be useful to distinguish between 'held' values (the experiences and beliefs people have that influence and shape how they assess things they encounter, including what they think of as good) and 'assigned' value (the importance that a person places on a particular thing, situation or experience, usually because of its contribution to some desired outcome or state).

Frameworks such as Total Economic Value (see Section 2.1 and Figure 2) and ecosystem services (see *e.g.* Kumar, 2010; Royal Society of New Zealand, 2011) are used by some disciplines to categorise values. Such frameworks can clarify thinking concerning types of (or sources of) assigned value, but the distinct categories in these frameworks can be difficult to apply in practice. For instance, 'cultural services' (or cultural values) are actually a bundle of, or derived from, other services and associated benefits (Chan *et al.* 2012), and are linked to 'held' values. It is misleading and confusing to suggest that cultural values and services are somehow distinct from services that provide economic, social and ecological benefit, or indeed that well-being can be divided into three or four distinct categories.

To try to account for these categories separately is likely to lead to confusion when attempting to define what gets included in the respective categories. For instance, a healthy population of whitebait has obvious ecological value. Harvesting the annual run of juvenile whitebait can also have commercial (economic) value to some people, which then enhances social well-being for these fishers. The whitebait population also provides cultural well-being amongst Māori and other groups for whom whitebait or fishing for whitebait (whitebaiting) has cultural significance. There is no obvious basis for drawing boundaries between these different types of value and well-being. The act of splitting the activity into types, some more measurable than others, illustrates how policy can end up producing inequity. It is usually desirable to have more of something that is measured, but this becomes problematic when it comes at the expense of things that are immeasurable.

Generally, in a planning context, New Zealanders refer to as 'values' the things and experiences that have value or meaning to them (what we might also call 'services' or 'sources of value'). Things and activities (*e.g.* whitebait and whitebaiting) are not 'values' in the terms defined by academics, but it is generally clear what people mean when they talk about these as 'freshwater values', *i.e.* that whitebait and whitebaiting have value or meaning for them.

7.2. Identifying and measuring values

Regional planning, at least as it is currently practiced, involves setting standards and limits for water bodies based on a desired state determined by the regional council. This is done on behalf of the community, having due regard to any relevant national policies and standards. This implies a need to identify how and for what purposes people value freshwater (or 'the ways that matter') and a process of deciding which are the most important amongst these. That further implies the reduction of complex and multiple realities into a manageable number of discrete objectives, through political processes that inherently risk disadvantaging certain members of the community.

Current regional plans, where they do document values for consideration in decision-making, focus on activities and uses. Social, cultural, metaphysical, intrinsic and other less tangible and more holistic values are not generally codified, and as a result tend to receive less consideration in decision-making.

It was evident from workshop discussions that some participants consider that certain things (*e.g.* other species, ecosystems, catchment geomorphology) have value independent of how they are valued by humans. It is not necessary for research or councils to resolve this debate. As long as some people think these things are important, *i.e.* that they have value for whatever reason, then as a democratic society we should take this into account. How *much* account we take of such values is a question that will ultimately have to be decided through democratic institutions, constrained by legislative instruments such as the RMA which are themselves a reflection of social norms and values.

7.2.1. Using RiVAS to inform decision-making

Within this context, the Tasman case study included consideration of RiVAS as a tool for the assessment of uses and values of rivers. Many of the VOW participants saw RiVAS as providing useful information, because it provides a consistent and transparent methodology for ranking the relative significance of different rivers for a given use or value, something that has been lacking to date. There were, however, also many who were cautious and in some cases sceptical about RiVAS, because of concerns about how indicators were selected and compiled, and the limitations of representing complex phenomena (*e.g.* habitat for several different fish species) with a single score. There were also broader concerns about the arbitrary nature of the categories themselves, the implications of how the rankings might be used in plans and decision-making, and a concern that quantifying some values may prejudice consideration of other values less amenable to quantification.

Assessing significance of uses values may be necessary, but it also has its challenges. There is a need for consistency but also an understanding of the changing and temporal nature of significance, and guidance on how to deal with temporary impacts. Some participants particularly object to the notion of significance as misleading and leading to illogical comparisons between local, regional and nationally regarded values. There was a general sense that the results of RiVAS expert groups should be validated by other users, including by other parties affected by setting significance. Where this has been done, the reaction has been mostly favourable. Without 'socialising' the results, there can be a suspicion that a small group has 'cooked up' an arbitrary set of rankings.

Discussion of whether RiVAS should be used to assess the significance of rivers for primary production or food security, instead of (or in addition) to irrigation, served to

demonstrate that the label used for a use or value can influence its perceived importance relative to others.

Quite apart from what it is called, the significance of land use for food production is an important consideration alongside more direct uses of water. There is a need for integrated planning across land and water to meet a number of objectives, not just equitable allocation of water for abstraction. Land use practices can have, to varying degrees, significant effects on natural character, water quality, flood control and eventually the quality of the coastal environment. If these effects are not taken into account, the objectives for freshwater management are unlikely to be achieved or, conversely, objectives might be adopted without appreciation for the wider social implications of trying to achieve them.

Reducing the ways that people find meaning (or value) in freshwater systems to defined categories and indicators has implications for management, as illustrated by the saying, 'what gets measured, gets managed'. Reductionism has become central to natural resource management and has produced significant advances in our ability to understand how natural systems function and are impacted by human activities. For example, the practices and outputs of freshwater science, which are often reductionist, provide a strong foundation upon which councils can assess and govern activities that have the potential to degrade the natural ecosystems upon which human well-being depends.

Regional councils, to fulfil their functions and meet community expectations regarding freshwater management, need to set priorities, specify management objectives and monitor and evaluate the effectiveness of their policies. These all require a degree of lumping and simplifying (reducing) how people understand and value freshwater systems. Councils cannot manage for intangible values that are specific to one individual, or address beliefs for which there is no transparent and accountable basis. However, they can manage for healthy freshwater ecosystems, understood in some measure by their physical, chemical and biological properties, and in so doing also provide for social, cultural and spiritual needs of at least many members of the community.

7.2.2. Reductionism and the shortcomings of freshwater management

Reductionism also has risks; in particular, it can marginalise those individuals and groups who find identity, meaning or value in a freshwater spring, a stream, river, lake or estuary in a way that falls outside of the categories defined by someone else, or is distorted or under-weighted within one of these categories. This is especially so for those people who lack the knowledge, resources, or ability to engage in the bureaucratic, political and often legal processes required to influence local government decision-making. In fact, the systems and processes that councils use to engage with their communities may well be more of a barrier to good freshwater

governance than a reductionist approach to management, although the two factors may at times be closely linked.

Other reasons for recent failures in freshwater management include the lack of clear policy targets and thresholds, the lack of integration between land and water management, and the delays in drafting, approving and implementing plans to achieve these while development proceeds apace. Many regional councils have well-intended objectives of maintaining and enhancing water quality in rivers, lakes and streams, but have nonetheless seen the health of their water bodies decline. This is because the high-level objectives are not adequately operationalised and consequently, the cumulative effects of land use are not well managed (Office of the Auditor General, 2011).

7.2.3. Value-articulating institutions and adaptive management

Tools such as RiVAS can be useful for getting a sense of how 'attributes that matter' are distributed across rivers in the region, which can provide a basis for both developing a vision and monitoring its achievement. But this must be done in a way that recognises that values are constructed and context-dependent, influenced in no small way by the metrics and functions we use to describe them. Further, it is crucial that reductionist tools (such as RiVAS), which provide the language and metrics of values, are used within wider processes that empower people who see the world differently to express their views.

This means that process is critical. How, when, where and by whom the question is asked can be as important as the question itself in influencing the values and preferences that people express. The practices used for framing, eliciting, measuring and describing values, rather than being objective descriptors of some fixed 'value', are being increasingly acknowledged as "value articulating institutions", i.e. ways that a society identifies and expresses the values of its members, and that these tools reflect particular worldviews of how society values nature (Brondizio *et al.* 2010; Jacobs 1997; Vatn 2005).

Like RiVAS, CM is a tool through which people can express their preferences, but which also shapes and influences how those preferences are revealed and reported. In hindsight, the CM survey conducted as part of the VOW study was not well integrated with the workshops and consequently not seen as particularly useful by the participants. Most were interested in the results, and some saw scope for the method to inform decision-making. But there were also many questions about the methodology and its underlying assumptions, including the need to reduce the attributes of interest to a handful of simplified indicators, the definitions and presentation of which were likewise contested by various participants. This highlighted the need to involve stakeholders in the use of these tools if the results are to be accepted as relevant.

Choice modelling is most likely to be useful for assessing well-defined alternative scenarios for a given landscape, system or resource, rather than comparing across three rivers as we did in this study. Attributes for CM studies should be developed in conjunction with interested stakeholders. As with RiVAS, awareness of the limitations of CM is essential. As explained by Norton & Noonan (2007):

> *We are proposing an alternative approach to evaluation of environmental change which shifts the unit of evaluative analysis from [willingness to pay] for atomized, discrete commodities, or clearly describable changes in scenarios, to development paths that can be evaluated according to impacts on multiple scales of time and space. In this way we can choose development paths to protect a range of human values, recognizing the multiple ways that humans value nature (p.672).*

7.3. Integrated planning: Visions, objectives, limits and rules

7.3.1. A new structure for Schedule 30?

A clear outcome of the VOW workshops was the proposal that a vision statement for a catchment could provide a means of expressing more holistic values and aspirations and thereby complement more reductionist lists of specific uses and values. Māori perspectives and aspirations might sit more comfortably here than as listed uses and values for which significance is assessed, although there may well be some sites for which the latter is also important. Vision statements could be developed through a community-led process or drafted by the council for public input. In either case the vision statements would be notified for submissions and hearings before they would become part of the regional plan.

In Workshop 5, participants trialled a proposed new structure for Schedule 30 that not only included a vision statement but also linked to other parts of the TRMP in a more integrated manner. This would help to overcome a tendency to compartmentalise different land and freshwater management decisions rather than improving the capacity to make decisions with consciousness of interrelationships.

The suggested new format (Table 7) is organised based on the main water bodies in the region, and would correspond with the way that the council identifies water bodies for management purposes. For each such management zone or cluster, the Schedule would indicate the highest level of significance of each value present in the catchment. Using an electronic format, a user could then ‘drill down’ to identify in which sub-catchment or reach the fish habitat is, its significance and the corresponding management objectives at that level. Land and water users could then refer to rules in the plan to see whether, and if so how, this affects their proposed activities.

Such a summary table could also help the council to identify how and where to prioritise various uses and values, *i.e.* what its management objectives should be for different catchments and zones in light of the distribution of uses and values across the region.

While management objectives would be a central feature of Schedule 30, detailed numeric standards, flow regimes and other limits as required by the NPS would be in a separate table. To reduce the need for the Schedule and associated tables to specify standards and limits for every water body, the TRMP could provide minimum or default standards for all catchments, such as the TRMP's default allocation limits for catchments not covered by specific flow provisions.

Objectives and policies specific to certain water bodies could be implemented through rules that classify various activities as permitted, controlled, discretionary or non-complying based on the significance of the other uses and values of that water body. Significance assessments might also be used to develop appropriate water quality or quantity thresholds and they might guide decisions about works and services provided by the Council.

7.3.2. Using Schedule 30

There is no simple method of 'balancing' to determine the 'best' or 'optimal management objectives for a freshwater system; ultimately this must be decided through a democratic process. The gathering of information to assist and inform the democratic process, of course, is subject to council decisions about work programmes. The TDC's upcoming review of water management in the Takaka River catchment is an opportunity for further development of Schedule 30. As well as evaluating performance against existing objectives, the coming review would be an opportunity to develop a vision statement and a hierarchy of goals, objectives and limits for the catchment that integrate across the various parts of the TRMP.

There were differing views amongst VOW participants about whether Schedule 30 should be used while it remains an incomplete listing of uses and values. Our view is that some information on the significance of some uses and values is better than no information. Proposed text in the TRMP says that TDC will take into account, when considering proposed activities on the beds of rivers and lakes, uses and values listed in Schedule 30 as well as other uses and values not yet identified but likely to be present.

A new policy could be added to the TRMP stating that, as a default position, the TDC would as a matter of priority provide for, at their current level, uses and values that have been assessed as having national or regional (or high or medium) significance. Activities that are inconsistent with maintaining these uses and values would be either

discretionary or non-complying activities in terms of the plan and would require resource consent.

In addition, the TDC could consider whether any controls on currently permitted or consented activities (*e.g.* land use intensification, permitted takes and discharges, *etc.*) would be required to avoid inadvertently giving priority to certain uses and values over others. The suggested structure for Schedule 30 is intended to make it easier to identify where activities managed under one part of the TRMP are putting at risk the achievement of objectives under another part. Lakes, wetlands and coastal lagoons would be an appropriate initial focus for council's consideration of whether permitted activities are likely to jeopardise the maintenance of uses and values that the community wants to protect.

In response to the challenges of scale, we recommend working with communities of interest around large catchments or clusters of catchments. In each community, a process would include both visioning and a more detailed discussion, assisted but not driven by tools such as RiVAS, about management objectives and development paths that are likely to provide for a suite of uses and values.

7.3.3. Working with communities of interest

In Tasman District, for instance, this would suggest possibly three such processes: one each for Golden Bay, the Waimea Plains, and the Murchison area. It is essential that conversations and decisions about managing freshwater systems also recognise their fundamental dependence on land use and their connections with coastal environments, even though doing so again expands the scope of the visioning and planning process.

We envisage that what could be called spatial planning would occur at these sub-regional scales. A community-led vision would set the overall direction and be translated into a hierarchy of objectives, limits and rules that recognise and make provision for a mix of land use and other activities across the landscape. This mix of uses and values would be informed by assessments of what is there now but also the potential for what could be there in the future.

The quantitative limits would be seen not as ends in themselves but as indicators of progress towards a vision, or as "thresholds of probable concern", *i.e.* "hypotheses of the limits of acceptable change" (Rogers & Biggs, 1999) and subject to review. In this way, the more holistic vision continues to guide the council's implementation of the plan and how it interprets and uses the more reductionist information on uses and values.

7.4. Participation and process

7.4.1. Learnings from the workshop process

Overall participation in the workshops was strong. Thirteen participants attended either four or five sessions, and another five were present at three. The least consistent participation was from those unable to make the first meeting, which suggests the importance of this initial gathering for setting the scene and creating an expectation of involvement.

Workshop 3 was the most demanding and the project team concluded that too much was asked of participants. The workshop was not the best setting for generating specific information on values of particular water bodies as it resulted in a long list of ways that rivers matter. While this was in itself a good thing, it was time-consuming and the format encouraged discussion rather than reaching agreement on what should be included in Schedule 30. Given more time, a narrower scope and a stronger imperative to reach agreement, a workshop process might work for this purpose, but it would benefit from a greater amount of pre-populated data.

Because the project had joint research and practical aims, there was an inherent tension between being outcome-directed and allowing for new directions to emerge in the workshops. Although some participants found the process had achieved less concrete deliverables than they would have liked, many others were relieved that the workshops did not simply confirm the *status quo*. The continued participation and overall positive reflections from participants at the end of the workshop series suggested that there was both an appetite for exploring new ways of working on freshwater management and a tolerance for the process uncertainty that this would entail. Being clear about these two objectives and reiterating the evolutionary character of the project was appreciated by participants and was important to maintaining participant confidence.

Overall, participants provided positive feedback about the process, which helped them to think about values in different ways and strengthened networks that can support subsequent council-led public discussions around water.

7.4.2. Community engagement in freshwater planning

While VOW participants did not express unhappiness with Tasman's existing regional plan provisions or decision-making, they are conscious of the need to implement national policy statements to manage increasing pressures on freshwater resources and expressed their views on the outcomes they were seeking from this.

Several participants said they wanted the TRMP to provide more certainty for stakeholders, in a way that was more accessible and understandable to lay people.

Some participants stressed that they want a different way of doing things, one that provides a more proactive and longer term perspective to managing water. Visions were seen as a way of meeting that ambition.

There was also a clear message from VOW participants that transparency in the decision-making process is important. Māori participants said that one of the benefits of the project was the face-to-face conversations and the enhanced relationships between themselves, other stakeholders and the Council.

The discussions about reductionism *vs.* holistic values also indicated the importance of giving a voice to less powerful interests and those less accustomed to dealing with freshwater science, indicators, regional plans and council planning processes. The view of sustainable management as a technical exercise implies an approach based on research and analysis, followed by consultation with the community of stakeholders to collect and assess information, i.e. to identify and elicit values so as to quantify, balance and optimise. This contrasts with a view that sees sustainable development as a challenge of deliberative democracy in which there is no single right answer but possibly many wrong ones, and where councils engage with stakeholders to make a decision in a collaborative fashion (Meppem and Bourke, 1999).

This then raises the question of how diverse interests are resolved in a deliberative democracy, even more so when the structure of local government itself is in question because of perceived governance failures (Clifton, 2012; Turnbull Group, 2009). Constitutionally, of course, the majority view prevails, but collaborative governance suggests something different, that decisions will be more robust, and communities more harmonious, when contentious decisions are arrived at through a more inclusive process that acknowledges alternative perspectives and seeks to accommodate them (Salmon *et al.* 2008).

Developing a hierarchy of visions, objectives, limits, policies and methods for each major catchment in New Zealand will be a challenge for collaborative governance, and there may be opportunities to learn from the experiences of the Land and Water Forum and Canterbury's Water Management Strategy and zone committee process.

7.5. Questions for further research

7.5.1. Questions about value and values

There is a lot more to learn about how New Zealanders value freshwater and how these values are formed. Questions arising from this case study include:

- How stable are people's preferences for alternative states of the environment?

- How much is missed in reducing the ways that people find value and meaning in freshwater to a limited number of categories?
- Whose values are not being heard and how can that be improved (*e.g.* Māori, children, future generations, identity values of local residents)?
- Planning processes tend to be dominated by those with the strongest interest, but what does the wider community think? Does this 'silent majority' have well-formed views and preferences, and if so, what are they? If not, will the wider community accept decisions reached by a collaborative governance process?

7.5.2. Use of RiVAS for eliciting and assessing values

There are related questions concerning the tools and approaches used to elicit and assess values, both for specific tools and more generically. One focus of this study was on how RiVAS could be used to inform decision-making. While it must be understood for the reductionist tool that it is, RiVAS is a useful way of collecting, collating and compiling information about uses and values of freshwater bodes.

RiVAS has been developed relatively recently, and there are accordingly a number of things that could be done to improve its usefulness for freshwater decision-making. The priorities identified during the VOW case study are listed in Box 1 in Section 5.1.4, and include assessing the significance of land use and primary production, hydro-electric development and other uses and values, refining the extended methodology for assessing potential value, developing some national consistency in thresholds of significance, and 'socialising the results' of RiVAS assessments.

7.5.1. A hierarchy of visions, objectives and limits

Questions about how values are formed are identified in Section 7.5.2. If most people do not have well-formed values, then related questions include what is the potential for deliberative processes that assume that values are not fixed but constructed in context, and what kind of tools and approaches can help individuals and groups to find common ground about a desired future and how to plan for it.

The following research topics could be investigated by further action research with a regional council undertaking a review of its objectives, limits and plan provisions for a major catchment, and willing to use a collaborative governance process to do so.

- Does the framework suggested by Rogers & Biggs (1999) of a hierarchy of visions, objectives and goals (or standards), with limits seen as 'thresholds of probably concern', suit the New Zealand context?
- How can vision statements be defined so that they acknowledge diverse perspectives but still provide meaningful direction for freshwater management?

- What engagement processes can be used to elicit the views and values of those who are not comfortable with RMA planning processes?
- What set of decision-making principles can best assist the deliberative process?
- What lessons can we draw from the implementation process for the Canterbury Water Management Strategy, involving a regional committee and zone committees of appointed members working collaboratively?
- What set of attributes and indicators would provide a reasonable basis for monitoring thresholds of probable concern for the ways that rivers, lakes, wetlands, groundwater and estuaries matter for New Zealanders?
- How do people's 'held' (core) values translate to visions and to the outcomes of freshwater planning? Can the realisation of these values be monitored and evaluated alongside other outcomes?
- How can visions, objectives, standards and limits be incorporated into RMA plans to provide a degree of both certainty and flexibility?

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The choice modelling survey described in Section 5.3 was designed, implemented and analysed with major contributions from Brian Bell and Michael Yap of Nimmo Bell Ltd and Yvonne Phillips of Waikato University, without whom the survey simply would not have happened. Ric Scarpa and Dan Marsh of Waikato University and Chris Batstone of Cawthron also provided much appreciated guidance and support.

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10. APPENDICES

Appendix 1. Tasman District Council's Schedule 30.1 (referred to in this report as simply Schedule 30) of the Tasman Resource Management Plan (TRMP).[21]

Schedule 30.1: Uses and Values of Rivers, Lakes, Wetlands, Aquifers and Coastal Waters

This schedule also includes, as appropriate, the waters of the estuaries and coastal margins listed in Schedule 25.1F. **D 1/05**

WATER BODY USES AND VALUES AND WATER MANAGEMENT OBJECTIVES		
Water Body	**Values/Uses Adversely Affected by Reduced Flows or Levels**	**Management Objectives**
(1) All groundwater (All groundwater may have any of these uses and values)	***In Situ* Uses and Values**	
	Contribution to river and spring flows. Phreatic communities	Prevention of seawater intrusion. Maintenance of aquifer pressures (abstraction rates to match recharge rates). Maintenance of contribution to river or spring flows.
	Other Uses and Values	
	Human consumption. Irrigation supply. Community water supply. Stock and farm water supply. Industrial supply.	Protection of water supply needs of stock and domestic users (provided there is full penetration of any alluvial aquifer). Maintenance of water users' security of supply at an acceptable level.
Specific Uses and Values of Aquifers		
(2) Upper Confined Aquifer **(3) Delta Zone Aquifer** **(4) Lower Confined Aquifer**	***In Situ* Uses and Values**	
	Contribution of flow to the Waimea River. Contribution of flows to Neiman and Pearl Creeks.	Maintenance of Waimea River minimum flow. Maintenance of Pearl Creek minimum flow and flows in Neiman Creek. Prevention of seawater intrusion. Maintenance of aquifer pressures (abstraction rates to match recharge rates).
	Other Uses and Values	
	Human consumption. Irrigation supply. Community water supply. Stock and farm water supply. Industrial supply.	Protection of water supply needs of stock and domestic users. Maintenance of water users' security of supply at an acceptable level.

D 1/05 D 1/05 D 1/05 D 1/05

[21] For the full schedule, see Chapter 30 of the TRMP (http://www.tasman.govt.nz/policy/plans/tasman-resource-management-plan/resource-management-plan-volume-1-text/resource-management-plan-part-v-water/#30).

(5) Motueka Plains, Central Plains and King Edward Zones Aquifers	***In Situ* Uses and Values**		
	Contribution to coastal springs' flows. Contribution of flow to Hau Plains Zone aquifer.	Maintenance of flows in coastal springs. Maintenance of flow to Hau Plains Zone aquifer. Prevention of seawater intrusion. Maintenance of aquifer pressures (abstraction rates to match recharge rates).	
	Other Uses and Values		**D 1/05**
	Human consumption. Irrigation supply. Community water supply. Stock and farm water supply. Industrial supply.	Protection of water supply needs of stock and domestic users (provided there is full penetration of any alluvial aquifer). Maintenance of water users' security of supply at an acceptable level.	
(6) Hau Plains Zone Aquifer	***In Situ* Uses and Values**		
		Maintenance of aquifer pressure (abstraction sources to match recharge rates).	
	Other Uses and Values		**D 1/05**
	Human consumption. Irrigation supply. Community water supply. Stock and farm water supply. Industrial supply.	Protection of water supply needs of stock and domestic users. Provision of alternative water supply to domestic water users in coastal margin to avoid effects of seawater intrusion. Maintenance or increase of water users' security of supply at an acceptable level.	**D 1/05**
(7) Karst Terrain Aquifers	***In Situ* Uses and Values**		
	Subsurface aquatic habitat. Contribution to Waikoropupu Springs, Motueka River and Riwaka River flows.	Protection of subsurface aquatic habitats. Maintenance of Waikoropupu Springs' and Riwaka River flows.	
	Other Uses and Values		**D 1/05**
	Human consumption Irrigation supply. Community water supply. Stock and farm water supply. Industrial supply.	Protection of water supply needs of stock and domestic users. Maintenance of water users' security of supply at acceptable level.	

(8) All surface water bodies (All surface water may have any of these uses and values)	**Instream Uses and Values**		
	Aquatic ecosystems, wildlife and aquatic plant habitat. Contact and non-contact recreation activities. Cultural and spiritual values. Landscape values. Contribution to lowland spring flows.	Maintenance of minimum low flows for instream aquatic values including fisheries values. Protection of contact and non-contact recreation activities. Protection of landscape cultural and spiritual values.	
	Other Uses and Values		**D 1/05**
	Human consumption. Irrigation supply. Community water supply. Stock and farm water supply. Industrial supply.	Maintenance of water users' security of supply at an acceptable level. Protection of supplies for stock and domestic users.	
Specific Uses and Values of Rivers and Wetlands			
(9) Waimea River	**Instream Uses and Values**		
	Aquatic ecosystems, wildlife and aquatic plant habitat. Contact and non-contact recreation activities. Cultural and spiritual values. Landscape values. Contribution to lowland spring flows. Instream native and trout fisheries values and trout passage. Contribution to Neiman and Pearl Creek spring flows.	Increased minimum low flows to protect native fish and juvenile brown trout habitat and limited brown trout passage during low flows. Maintenance of Neiman and Pearl Creek flows. Protection of recreational activities. Protection of cultural, spiritual and landscape values.	
	Other Uses and Values		**D 1/05**

Schedule 30 lists additional water bodies and their uses and values.

For the full schedule, see Chapter 30 of the TRMP, available online: (http://www.tasman.govt.nz/policy/plans/tasman-resource-management-plan/resource-management-plan-volume-1-text/resource-management-plan-part-v-water/#30).

Appendix 2. Participants in Valuing Our Waters (VOW) case study.

The people listed below participated in one or more of the workshops for the Valuing Our Waters project. Four participants attended all five sessions; nine attended four; five were present at three. Four participants attended only one or two workshops, and two others attended the first workshop and then were replaced by alternates with similar expertise. The six members of the research team attended all five workshops.

While the table lists participants' organisations, they were invited for their own expertise and not to represent a particular sector or interest. In addition, many participants had experience and expertise beyond the roles cited below, *e.g.* as kayakers, swimmers and residents interested in community development.

Name	Organisation and/or area of expertise
Andrew Karalus	Nelson Forests Ltd
Barbara Stuart	Walking Commission and NZ Landcare Trust
Chris Keenan	Horticulture NZ
Daren Horne	Tangata whenua
David Inch	NZ Energy Ltd
David Melville	Ornithologist
David Speedy	Nelson-Marlborough District Health Board
Ed Kiddle	Nelson-Marlborough District Health Board
Debs Martin	Royal Forest and Bird Protection Society
Evan Baigent	Farming and irrigation interests
Gavin O'Donnell	Federated Farmers
Jeff Cuthbertson	Infrastructure and assets, Tasman District Council
John Wilson	Aquaculture interests
Ken Polglase	Swimming and whitebaiting
Kura Stafford	Tiakina Te Taiao
Laura Marra	Trustpower
Marlin Elkington	Tiakina Te Taiao
Martin Rutledge	Freshwater ecologist, Department of Conservation
Moetu Stephens	Tangata whenua
Neil Deans	Nelson-Marlborough Fish and Game Council
Peter Thomson	Infrastructure and assets, Tasman District Council
Roger Young	Freshwater ecologist, Cawthron
Shelagh Noble	Tasman District Council
Sue Brown	Federated Farmers
Tony Entwistle	Fishing guide
Trevor James	Freshwater scientist, Tasman District Council

Appendix 3. Selection of 'held' values identified in Workshop 1.

Workshop 1 included an exercise that asked participants to identify some of their 'held' values concerning freshwater (see Section 4.1). The values offered by participants on post-it notes are listed below. They were sorted into the following themes by the research team after the workshop.

Spiritual/Wairua

- Life source/Life force/Spiritual – mauri – life supporting capacity
- Wairua – mauri
- Water is the 'lifeblood' of the land and needs to be healthy
- Life force; soul food; Beauty – 'use' does not have to be extractive
- Naturalness, purity
- Life-supporting and spiritually supporting
- Supports all life – worth protecting
- Happiness – Being close to nature; Water an integral part of nature

Identity

- I was born there – creates a sense of place, of treasured childhood, memories of how it was.

Recreation

- Rivers: I like nothing better than kayaking a clean, natural river… it allows me to – "feel, live, connect with, play with and appreciate a landscape." Like a whio, hydraulics are a play thing, to immerse, submerge in, go with the flow. Facilitate a journey/social event with friends, *e.g.* multi-day rafting.
- Somewhere to play
- Water is an important source of recreation
- Non-commercial recreation; fun. Accessible – location – over time.

For benefit of all

- Access for all to use; competing uses
- Water should be available to meet people's basic needs
- Quality/Community/Cultural Well-being: Safety/Shelter/Food and Water

Water as a resource/ material well-being/development

- Resource: irrigation, hydro, flood control
- Energy capacity

- Enables progress: essential role in enabling people and communities to provide for their social, cultural and economic development
- Water is 'valuable' and should be used 'efficiently'
- Useable

Public – not owned

- Belongs to everyone and for the future
- Public resource (not owned)

Other species – water in its own right

- Rivers are more than resources – they are entities; How we treat water reflects how we treat ourselves
- Water rights should be available to all beings: human and nonhuman
- Humans are just one species – there are many others dependant on water
- Water has its own value
- Habitat, biodiversity

Water cycle/connectedness

- Maintain connectedness – landscape – community
- Water cycle – connected – linking
- Indicator of healthy land

Process and engagement

- Responsibility – humans as guardians
- Processes we use to make judgments about water should be creative, honest, equitable

Other comments

- Environmental influences
- Clean
- Wide range of attributes.

Appendix 4. The mock proposal used in Workshop 5.

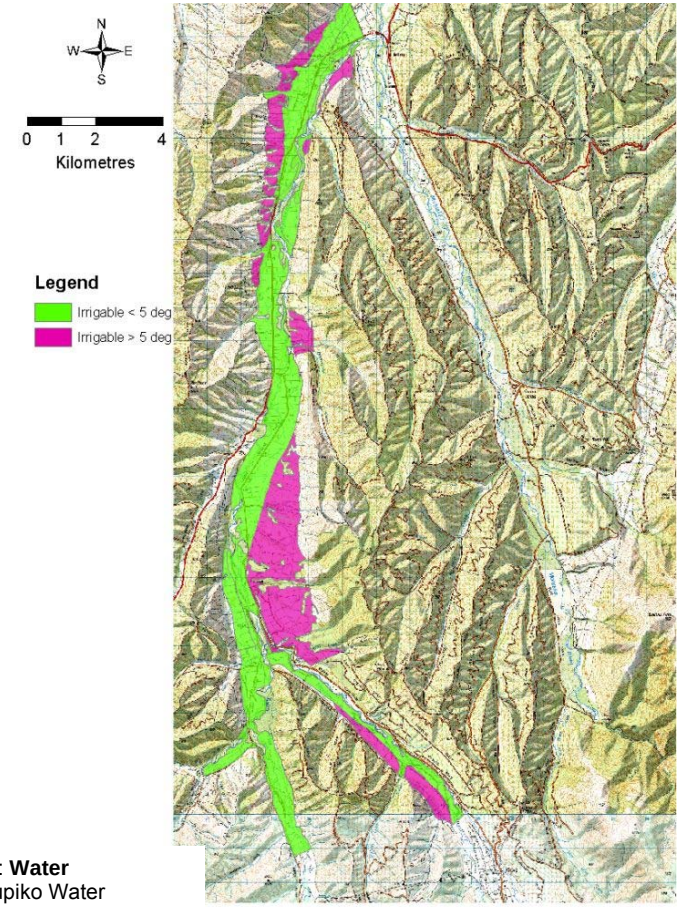
A Community Irrigation Proposal for the Motupiko Catchment*

The Motupiko Catchment Water Augmentation Committee (MCWAC) proposes to develop a community irrigation scheme for the Motupiko subcatchment of the upper Motueka Valley:

- Total irrigable land was calculated at 3228 hectares (see map)
- The lower Motupiko has greater versatility for a range of irrigated crops such as berries and vegetable crops, but pasture irrigation for dairy development is the most likely irrigated land use. Climate factors such as frost and climate change are the main constraints on future irrigable crops.
- The study identified two large scale storages (>3 million cubic metres (MCM)), eight medium sized storages (1-3 MCM) and 17 small scale storage sites (~0.6 MCM). However the preferred site is M4 Horopito (see map, next page)
- Environmental effects were assessed qualitatively. Construction of dams on mainstem sites in the Motupiko (*e.g.* Kikiwa and Rainy) is prevented by the Motueka Water Conservation Order. No fatal flaws were found which would prevent M4 Horopito proceeding to consent stage.
- Final costings based on releasing dammed water into the Motupiko River to meet irrigation demand above that naturally provided by river flows, and while maintaining Motupiko River flow past Quinneys Bush, were:

Site Name	Assumed area served (ha)	Cost including land and financing ($ million)	Comparative capital cost/ha ($/ha)
Horopito M4	1 350	6.17M	4,570

Economic analysis indicates that based on repaying the capital cost over a 20, 30 or 40 year period at 8% interest rate for a dam servicing 1000 ha the cost per hectare per year for the Horopito M4 would be $489, $426 and $403 respectively. Landowners would also face the costs of on-farm capture and delivery of their share of water released via the river system. A community survey of all landowners in the Motupiko together with two public meetings showed qualified support at the projected costs.



*Information for this case study extracted from: Fenemor, A.D.; Pickens, A.; Davie, T.J.A.; Dawson, M.; Basher, L.; Barringer, J. 2007: **Water Augmentation Options for Irrigation in the Motupiko catchment.** Landcare Research consultancy report LC0607/157 for the Motupiko Water Augmentation Committee, 69pp.

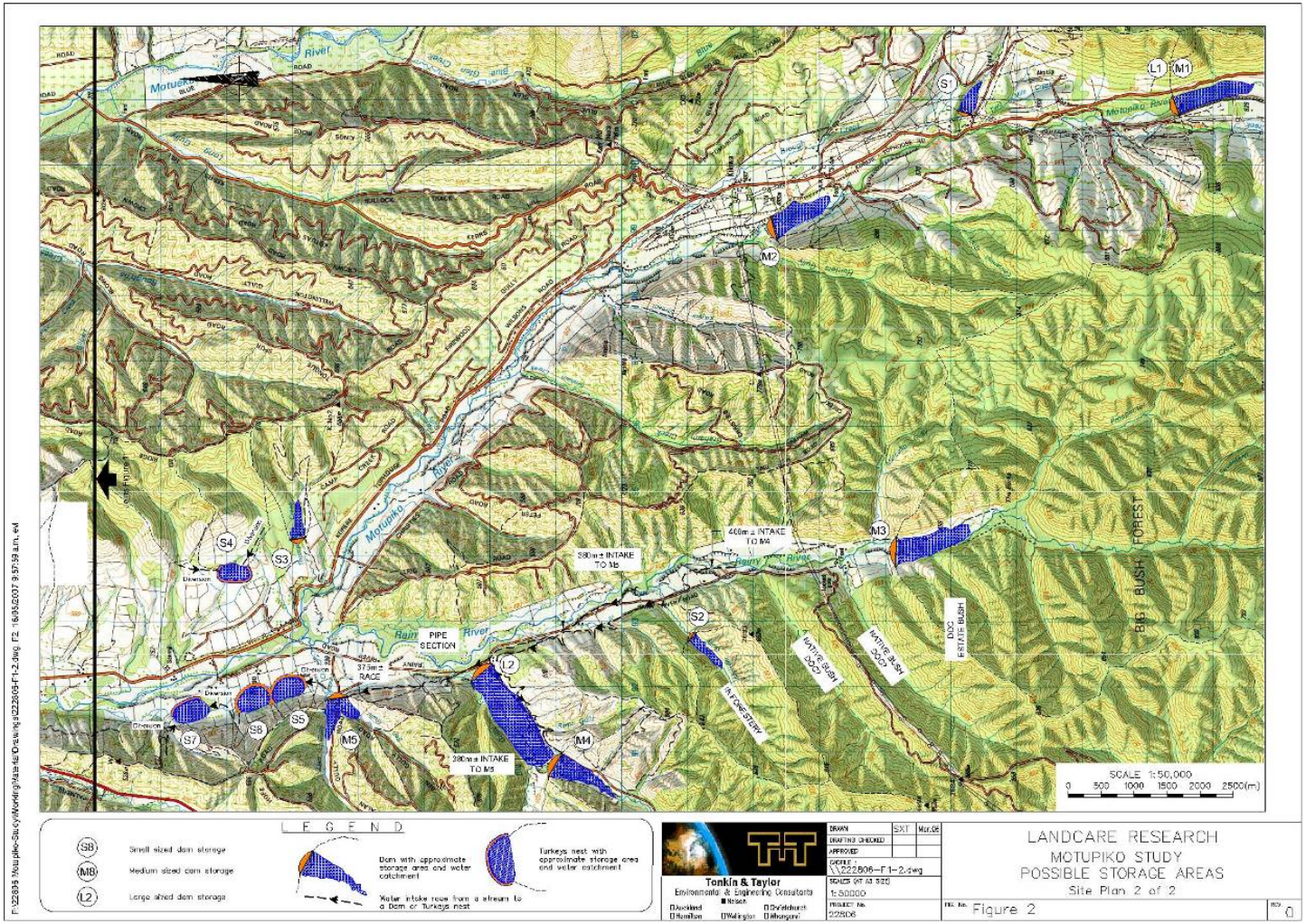


Figure 12. Desk-top selection of potential medium (M), small (S) and large (L) reservoir sites, upper Motupiko and Rainy tributary.