

Part B: River swimming in the Tasman District: Application of the River Values Assessment System (RiVAS)

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7.1 Introduction

7.1.1 Purpose

This section presents the results from an application of the river values assessment system (RiVAS) for river swimming in the Tasman District undertaken in June 2010. This is the second application of the RiVAS for river swimming. A workshop was held on 25 June to apply this method to Tasman District rivers. Hughey et al. (Chapter 3, herein) outline the RiVAS method.

7.1.2 Preparatory step: Establish an Expert Panel

The Expert Panel for the swimming application in the Tasman District comprised Mary-Anne Baker, Trevor James and Rob Smith (all of the Tasman District Council). Kay Booth (Lindis Consulting) acted as an advisor. Credentials for the Expert Panel are provided in Appendix 7B-1.

7.1.3 Summary of this assessment

The Expert Panel identified eight resource and user attributes to assess 62 known river swimming locations in the Tasman District. The method was applied to differentiate swimming sites of regional significance (n=14) from those of local significance. Few data were available, so the Expert Panel relied on their own assessments for most attributes. Minor revision was made to the RiVAS approach for swimming, notably amalgamation of the two facilities-related attributes, and use of a 3-point scale (rather than a 2-point scale) for indicator thresholds.

7.2 Application of the method

7.2.1 Step 1: Define river value categories, river sites and levels of significance

River value categories

The Expert Panel confirmed the definition of 'swimming' as:

1. Contact recreation (participants get wet);
2. Site-focused (participants get in and out of the water at the same location); and
3. No commercial dimension (swimming is not offered as a stand-alone¹ commercial recreation opportunity).

This definition encompasses swimming, playing around in the water and paddling. While these different activity styles may require different resource conditions (e.g., shallow slow-moving water c.f. deep holes) the Expert Panel believed they could be addressed collectively.

River sites

Swimming is site-specific and it was agreed that it was appropriate to focus on specific river locations (sites). However, multiple swimming sites occur on some river reaches in the Tasman District. For practical reasons, these sites were treated as a set (i.e., the river reach was used to describe this set of swimming sites). Where sites within such reaches were considered important (e.g., they receive considerably more use than the other sites in that reach), they were separately listed.

¹ Some commercial recreation trips may incorporate swimming as part of the experience.

In preparation for the workshop held on 25 June, Council planners consulted with selected high schools in the District (Golden Bay, Motueka and Murchison High Schools – teachers co-ordinated student input) to collect information about sites used for swimming and their attributes.

A list of swimming sites (and reaches to represent multiple sites) was compiled using information from the schools, the Council's water quality monitoring sites, and sites known to the Expert Panel from their local knowledge. A final list of 62 sites (which includes four sets of sites – referred to as a reach) was derived for application in this study (see Appendix 7B-4).

Swimming sites without public access were excluded from the analysis.

A brief discussion on hot springs concluded that they would fit the definition of a swimming site and the activity, likewise, could be considered 'swimming'. This was a hypothetical discussion, as Tasman does not have any springs with public access for swimming.

It has been assumed that any sites where swimming takes place which are not listed are of only highly localised value. The Expert Panel commented that there are a lot of sites that would fit this category.

Levels of significance

Following the RiVAS method for swimming (Booth et al., 2009), it was agreed that the method would be used to identify regionally and locally significant swimming sites (not national significance). It was noted that swimming as an activity (or river value) is nationally significant.

Outcomes

The activity of swimming was defined (see above).

A list of swimming sites was defined using the list of Council water quality monitoring sites, information gathered from high schools and local knowledge.

Significance of a site for swimming was agreed to be either regional or local (not national significance).

7.2.2 Step 2: Identify attributes

Attributes to describe river swimming developed for the Manawatu-Wanganui case study (Booth et al., herein) were 'taken as given'.

Outcome

A list of all attributes is provided in Appendix 7B-2. This list is the same as that presented for the Manawatu-Wanganui Region.

7.2.3 Step 3: Select and describe primary attributes

The primary attributes used for the Manawatu-Wanganui case study were discussed and adapted following application to Tasman rivers. One revision was made to the primary attributes: the two attributes associated with facilities were combined into one, specifically:

- Facilities: 'presence of toilet'; and
- Camping opportunities: 'presence of camp facilities'.

This became

- Facilities: 'presence of facilities' (which includes toilet facilities and camping facilities).

Outcome

Appendix 7B-2 identifies the eight primary attributes (in bold) and describes them.

7.2.4 Steps 4 & 5: Identify indicators & determine indicator thresholds

Indicators were adopted from the Manawatu-Wanganui application, with revision for the modified (combined) facilities primary attribute (as described in Step 3).

The thresholds developed as part of the Manawatu-Wanganui case study were modified to match the approach taken for other river values within the RiVAS system and better differentiate between sites. Therefore, instead of using a 1-2 scoring system, a 1-3 scoring system was applied. This was a recommendation of the Manawatu-Wanganui swimming report. Care was taken to match (and add to) the thresholds used in the Manawatu-Wanganui application as much as possible.

The Expert Panel developed thresholds that would fit nationally (for most attributes) and within the Tasman District. It was acknowledged that the thresholds may be set to best suit Tasman conditions and they may need to be fine-tuned in future applications.

Discussion associated with the primary attributes and their indicators included:

1. *Water clarity*: Horizontal visibility

It was agreed that it is useful to apply the national guidelines (ANZECC, 2000) for horizontal visibility. Thresholds adopted the 1.6m trigger point used in the guidelines and added a 3.0m additional threshold.

2. *Swimming holes*: Maximum water depth

It was agreed that where a site was large, then an average across the site would be used. Where a collective of sites (a reach) was assessed, the average across the sites was used (the average of each site's maximum depth).

Thresholds were set as <2m and >3m.

3. *Variable water depth*: Morphological variability

This indicator was renamed - the previous terminology was 'river bed profile'. It remains the same indicator, just with a new name. The revised thresholds were low-med-high variability (c.f. previous application which used flat or variable).

Where sites are considered as a collective within one reach, the measure was the variability of each site averaged across all sites (rather than the range of variability across sites).

It was agreed that the threshold scores for this indicator ranged from 3 = presence of deep holes *and* shallow water, to 1 = very shallow, very safe 'gentle' site that provided an opportunity for people with little swimming ability.

The difference between variability and water depth was discussed. It was felt that shallow rivers would score lower for this indicator as they had little opportunity for variability in their depth. In Tasman District this equates to gravel river beds. Rivers with hard rock outcrops (e.g., mid section Motueka River) have greater variability in depth.

4. *Algae*: Compliance with national guidelines

A breach of the draft national cyanobacteria guidelines (MfE/MoH, 2009) triggers the Council to consider posting public health warnings. Therefore, this indicator influences the public's perception of site safety, as well as providing a physical measure of public health risk. Other periphyton (filamentous algae and diatoms) may be a nuisance to swimmers and has national guidelines (Biggs, 2000). Compliance with both sets of national guidelines (MfE/MoH, 2009; Biggs, 2000) was the indicator. The assessment was kept simple – the indicator score being % time the site met both guidelines (thresholds of 25% and 50% of the time). Repeated breaches of either health risk or nuisance algae guidelines diminish the swimming value of the site.

5. *Scenic attractiveness*: Overall rating

The Panel identified that this included local features (e.g., granite outcrops) as well as the surrounding landscape. As with the previous application in the Manawatu-Wanganui region, this attribute was assessed by the Expert Panel. Ideally, a professional landscape assessment or users' perceptions would be used.

It was agreed that the assessment considered people in the water as well as those on the shore. In other words, 'swimming' encompasses shore-based use.

In its assessment, the Panel initially discussed specific sites and used these as reference points (e.g., high scoring (score of 3) sites included Paynes Ford and Salisbury Bridge; low scoring sites (score of 1) were Riwaka at SH60 and the Lower Motueka). All other sites were then assessed relative to these sites.

It was felt that Tasman sites may rate very highly in a national assessment. The current assessment had integrity *within* the District.

6. *Origin of users*: Km travelled that day (from previous night's accommodation)

It was agreed this measure was the mean distance travelled to the site *that day* by users (i.e., from their location the previous night). This differed from the Manawatu-Wanganui approach which used travel distance *from home*. Similarly, it differs to the salmonid angling river value approach (also distance from home). The reason for this adjustment in the swimming method was that swimming is usually not the primary reason people travel to a site, and Tasman is a popular visitor destination. Distance from home would unduly weight towards sites popular with tourists.

People who had travelled from a camping site, for example, would record distance from the camping site (not from home), e.g., international visitors (especially rock climbers) camp at Paynes Ford and often swim there, but they were not attracted to Paynes Ford *because* of the swimming opportunity.

The Panel considered the distance travelled in terms of a radius from the major population centre (Nelson) rather than the distance travelled by road.

It was noted that swimming is often a secondary activity on a recreational trip. Pelorus Bridge is a good illustration – many people plan to stop and have a swim but seldom travel there specifically for that purpose.

An interesting variant for this indicator may be how far people would go to access a favoured swimming site.

Following consideration of Tasman swimming sites, thresholds were set at 10 km and 20 km (<10 km, 10-20 km, >20 km).

7. *Levels of use*: Number of swimmers per day

Since no data were available, the Expert Panel estimated swimmer numbers (high-med-low). As for some other indicators, reference sites were chosen to assist with the assessment.

Considerable discussion ensued about the most useful and practical indicator – peak number (the number of users at any one time on a peak use day) c.f. user numbers over a peak use day. It was agreed that the metric would be finalised in the coming months, as the Council intends to monitor users at selected swimming sites during the 2010/2011 summer.

It was agreed that the thresholds set for this indicator were relevant to the Tasman District and applications elsewhere could adjust for the regional population (e.g., Auckland could apply a ten-fold factor as Auckland's population (rating base) is ten times that of the Tasman District). This is based on the premise that residents (c.f. visitors) undertake most of the swimming activity in Tasman.

8. *Presence of facilities*: Combined the previous two indicators of 'presence of toilet' and 'presence of camp facilities'.

The chosen thresholds were: 1=no facilities, 2=toilet only, 3=camp and toilet facilities. The definition of these facilities was adopted from the Manawatu-Wanganui study:

Maintained toilets available at the site

Camp facilities maintained by the Territorial Authority, another public agency or a private provider (e.g., designated camping sites, ablution block, signage).

For swimming sites within river reaches (e.g., three reaches on the Motueka River and one on the Waimea River), the assessment was derived from the average of the sites within the reach – not the sum of the sites. Therefore, if user numbers were high at a few sites but not others, it depressed the level of use score for the set of sites within the reach.

It was noted that there was an additional value for sites within such reaches – swimmers had a wide choice of location (e.g., if a site was busy).

Outcome

Indicators and thresholds are listed in Appendix 7B-2 and indicators are assessed against SMARTA criteria in Appendix 7B-3.

7.2.5 Step 6: Apply indicators and indicator thresholds

Expert Panel estimates were required for most indicators. Some data were available for three indicators: water clarity, algae and facilities.

Outcome

Data estimates are given in Appendix 7B-4.

7.2.6 Step 7: Weighting the primary attributes

The Expert Panel reviewed the eight primary attributes and considered whether some made a relatively greater contribution to the rating of swimming value.

Several weighting scenarios were tested – various combinations of *Levels of use* and *Facilities* were increased in weighting (see Appendix 7B-4). Given that the facilities attribute had decreased from two attributes to one, this was weighted x2 as part of this phrase of the assessment. Results from the weighting scenarios were compared with an equal weighting analysis, and the rank order of rivers examined.

The decision was made to keep weightings equal. It was noted that the use of equal weighting ranked rivers that received high levels of use, as well as rivers that scored well for other reasons, as would be expected, not just those that provided additional facilities. The Panel felt this was a good outcome, as it balanced the attributes in an appropriate manner.

Outcome

Equal weighting. See Appendix 7B-4.

7.2.7 Step 8: Determine river site significance

Step 8a: Rank sites

The spreadsheet was used to sum the indicator threshold scores for each swimming site. Since we had chosen to have equal weightings of the primary attributes, we did not have to first multiply the threshold scores by the weightings. The sums of the indicator threshold scores were placed in a column and then sorted in descending order. These sums were then converted into rankings (1st, 2nd, 3rd, etc) to provide a list of the sites ranked for their swimming value.

Step 8b: Identify river site significance

Using the ranked list from Step 8A, the Expert Panel closely examined the river sites and their attribute scores. The Expert Panel looked for cut off points in the list of swimming sites. A score of 19 looked like the appropriate threshold for regional significance (i.e., the Panel's knowledge of sites suggested that those scoring 19 and above were of regional significance and those below 19 were not).

The Wairoa River at WEIS weir scored 18 so was assessed as being of local significance. One characteristic of this site is the width of the swimming hole – you can use it for training as it is approximately 50m across and quite long. This feature is not covered by any of the attributes. It was decided that this site was an outlier and that the importance placed on this site by the Panel should be recorded, but the assessment should not be adjusted to try to 'elevate' it. As noted in other RIVAS assessments, sites very close to thresholds need to be treated with some 'give and take'.

At this stage of the assessment, some general comments about swimming sites and rivers, as well as their perceived importance, were made including:

- The Panel expected the Motueka River to score as the most significant river for swimming in Tasman District – not all its sites did. Since the assessment is site focused, the value of rivers like the Motueka which provide many swimming sites, is lost somewhat. For this reason, it is very important to note the *number of sites* on any given river. This relates to the value of a whole waterway compared with the value of a specific site.
- Similarly, the Waimea River, as a complete waterway was expected to be regionally significant. Its value primarily lies in its close proximity to the main population centre and the ease of access over its entire length. However, its individual sites did not achieve regional significance listing. Again, this was partly due to the range of sites available.
- Conversely, the Motupiko site at Quinney's Bush was listed as regionally significant due to its close proximity to a very popular camp ground and not because the site is particularly noteworthy by itself.
- Tasman District has nationally recognised beaches and therefore sea swimming opportunities ('trips to the beach') are probably better known than its abundance of river swimming opportunities. Indeed many of the campgrounds and accommodation options are located to capture the advantages of the beach rather than the river. This may suppress river-based swimming (i.e., on any one day it is possible that there will be many times more people at the four most popular beaches than at all the river sites combined).

- Disaggregating swimming from the recreational trip was noted as a challenge to the method. As discussed earlier, swimming is often one component of a trip and not always the primary purpose.

Simplified assessment process

The simplified process developed as part of the Manawatu-Wanganui case study was not applied. This followed the recommendation from that report that “the full method provides a more robust assessment and should be used wherever possible” (Booth et al., herein).

Outcome

A list of sites ranked by a scoring system from highest to lowest, which represents an initial significance ranking list. See Appendix 7B-4.

Sites identified as significant at the regional and local level. See Appendix 7B-4.

Sites where people swim which are not listed have only highly localised swimming value.

7.2.8 Step 9: Outline other factors relevant to the assessment of significance

This step comprises two parts: (1) identification of site characteristics desirable for swimming; and (2) discussion of factors which are not quantifiable but considered relevant to significance assessment (see also Appendix 7B-5).

Desirable site characteristics for swimming

Characteristics of sites considered highly desirable for swimming were adopted from the Manawatu-Wanganui report. In most (but not necessarily all) cases, a ‘good’ swimming site will have all of these characteristics. A change in any of them may affect the ability to undertake swimming at the site or the perception of its attractiveness to users. See Appendix 7B-5.

Desirable site characteristics include:

1. Public access available;
2. Appropriate flow (velocity);
3. Adequate river width;
4. Perception of safety; and
5. Presence of beach.

Other factors relevant to significance assessment

- Future use of a site – the desire to avoid precluding swimming at a site in the future;
- Degree of scarcity (or rarity) of the experience.

Outcome

List and description of non-measured attributes (Appendix 7B-5).

7.2.9 Step 10: Review assessment process and identify future information requirements

Few data were available to inform this case study. Desired data are noted in Appendix 7B-6.

References

- Australia and New Zealand Environment and Conservation Council (ANZECC) (2000). *Australian and New Zealand guidelines for fresh and marine water quality*. Australia and New Zealand Environment and Conservation Council, and Agriculture and Resource Management Council of Australia and New Zealand.
- Biggs, B.J.F. (2000). *New Zealand periphyton guidelines: Detecting, monitoring and managing enrichment of streams*. A report prepared for the Ministry for the Environment, Wellington, New Zealand.
- Booth, K., Gilliland, B., McArthur, K., Marr, H. Herein. *Swimming in Rivers: Application of the RiVAS*.
- Hughey, K., Booth, K., Deans, N., Baker, M-A. Herein. *River Values Assessment System (RiVAS) – The Method*.
- Ministry for the Environment and Ministry of Health. (2009). *Draft New Zealand guidelines for managing cyanobacteria in recreational waters*. A draft prepared for the Ministry for the Environment and the Ministry of Health by S.A. Wood, D.P. Hamilton, W.J. Paul, K.A. Safi and W.M. Williamson.

Appendix 7B-1

Credentials of the Expert Panel members and advisor

The Expert Panel comprised three members. Their credentials are:

1. **Mary-Anne Baker** is a policy planner with Tasman District Council, with 20 years experience in soil conservation and freshwater management. She has contributed to the preparation of the Council's water and contaminant discharge management provisions in its Resource Management Plan.
2. **Trevor James** is a resource scientist at the Tasman District Council, with 18 years experience in both the private and public sector. He is responsible for surface water State of the Environment monitoring and assessment at Council, with familiarity of, and access to, water quality data for the District.
3. **Rob Smith** is the Environmental Information Manager at Tasman District Council with 18 years experience in the monitoring or management of freshwater resources.

Advisor:

1. **Dr Kay Booth** is an outdoor recreation researcher and planner. She is the Director of Lindis Consulting and, until recently, a Senior Lecturer in parks, recreation and tourism at Lincoln University. She has more than 30 peer-reviewed outdoor recreation research publications and holds appointments on the New Zealand Walking Access Commission and the New Zealand Conservation Authority.

Appendix 7B-2 Assessment criteria for swimming (Steps 2-4)

ATTRIBUTE CLUSTERS	ATTRIBUTE (primary attributes in bold)	DESCRIPTION OF PRIMARY ATTRIBUTES	INDICATORS	INDICATOR SIGNIFICANCE THRESHOLDS	DATA SOURCES (AND RELIABILITY)
Step 2: Identify attributes Step 3: <u>Select</u> and describe primary attributes		Step 3: Select and <u>describe</u> primary attributes	Step 4: Identify indicators	Step 5: Determine significance thresholds	
ATTRIBUTES ASSOCIATED WITH EXISTING USE					
Social	Level of use	High use implies high value. This may not hold true for two reasons: Remote places , which offer few encounters with other people, may be highly valued for their wilderness value and the experience of 'having the place to ourselves'. Crowding may occur at popular sites, which may turn people away. This may be anticipated and the site not chosen for a swim, or occur on arrival (displaced to another nearby site, if one exists).	Number of swimmers on a peak use day NOTES: Alternative indicators: 1. Maximum number of swimmers at peak time on a peak use day 2. Number of swimmer days p.a.	High (score: 3) Medium (score: 2) Low (score: 1)	Expert Panel estimate (good)
	Travel distance	Origin of users is suggested as an indicator of quality of the recreational experience, based on the assumption that the higher the expected quality of the experience, the greater the distance users will be prepared to travel. A site close to a large population (short travel distance) will receive more use for reasons of convenience (close to home) resulting in a higher level of local use rather than necessarily signifying regional importance.	Number of kms travelled by swimmers from previous night's location NOTES: Travel time was considered but distance offers a more standard metric as time introduces the factor of travel style (e.g., walk, car, cycle).	High: >20 km (score: 3) Med: 10-20 km (score: 2) Low: <20 km (score: 1)	Expert Panel estimate (poor)
	Perception of safety	Overall evaluation that accounts for a range of perceptions (e.g., flow, water quality, presence of others). Outcome of swimmers' decision-making can be measured via numbers of swimmers attribute.	Desirable site characteristic		
	Other users and uses	This includes other users' demographics, their behaviour and the style of their use (e.g., organised events). The types of people who frequent a site may influence its perceived suitability (e.g., site popular with young males who 'take over the place').			
	Diversity of recreation	Swimming is often undertaken by groups with a range of activity			

ATTRIBUTE CLUSTERS	ATTRIBUTE (primary attributes in bold)	DESCRIPTION OF PRIMARY ATTRIBUTES	INDICATORS	INDICATOR SIGNIFICANCE THRESHOLDS	DATA SOURCES (AND RELIABILITY)
	opportunities	interests. For example, young children who paddle with their parents, some family members who want to go fishing, others who want to sun bathe and swim to 'cool off'. The diversity of opportunities available to cater for different group members may therefore increase a site's attractiveness.			
Amenity / managerial setting	Presence of facilities	When a site is well used, councils provide facilities (such as toilets). However, the provision of facilities may also encourage use (people go to sites where there are toilets, which means they can plan to stay all day, for example). Since some councils provide a higher level of facility provision than others, the Expert Panel needs to maintain oversight of these data. Camping indicates significant length of stay and a swimming hole can be well used by local campers. Camping facilities may be provided by different types of provider (public or private). Since some councils have a greater propensity to provide facilities than others, the Expert Panel needs to maintain oversight of these data. NOTES: This attribute does not include freedom camping which can happen almost anywhere.	Presence/absence of toilets maintained by the Territorial Authority Presence/absence of camping facilities (e.g., designated camping sites, ablution block, signage, etc) maintained by public or private provider	Camp + toilet (score: 3) Toilet only (score 2) Absent (score: 1)	Council data (excellent) Expert Panel estimate (excellent)
	Maintenance activities	Some form of council maintenance (e.g., lawn mowing, rubbish collection, weed control) suggests high usage sites.			
	Public access - unrestricted public access; no access charges; easy practical access	Public access to the site and within the site to the water is critical. This attribute is one of the essential elements of swimming sites – without access, no swimming can occur	Desirable site characteristic		
	Jump-off points	A high point (e.g., bridge, rope swing) adds to the swimming site - amenity feature			
Aesthetic /	Perception of scenic	It is expected that there is a positive correlation between perceived	Perception of scenic attractiveness	High (score: 3)	Expert

ATTRIBUTE CLUSTERS	ATTRIBUTE (primary attributes in bold)	DESCRIPTION OF PRIMARY ATTRIBUTES	INDICATORS	INDICATOR SIGNIFICANCE THRESHOLDS	DATA SOURCES (AND RELIABILITY)
scenic	attractiveness	scenic attractiveness and swimming amenity. This attribute refers to the integrated set of aesthetic components, many of which are listed as separate attributes in this cluster (see next rows). Ideally a professional landscape assessment would be used or else the perceptions of swimmers. In the absence of these data, Expert Panel estimates were used.		Medium (score: 2) Low (score: 1)	Panel estimate (good)
	Degree of naturalness	Amenity feature			
	Wilderness character	Amenity feature			
	Visual landscape back-drop	Amenity feature			
	Flora and fauna	Amenity feature			
	Open space	Amenity feature			
	Natural features that offer jump-off points (big rock, cliff, etc)	Amenity feature			
	Water temperature	Amenity feature			
Cleanliness and tidiness	Amenity feature				
Physical river features	Swimming holes	The opportunity to dive and play around in deeper water was considered to be an attractive feature – people often talk about ‘good swimming holes’	Maximum water depth	High: >3 m (score: 3) Medium: 2-3m (score: 2) Low: <2 m (score: 1)	Expert Panel estimate (good)
	Variable water depth	A flat river bed was considered less attractive for swimming than a variable (shallow + deep) bed profile.	Morphological variability	High (score: 3) Medium (score: 2) Low (score: 1)	Expert Panel estimate (good)
	Width of river	A river needs to be wide enough to make it worthwhile for swimming	Desirable site characteristic		
	Flow	Velocity <1 m/s, as >1 m/s is too fast for an adult to wade (at depth of 1 m after which point person likely to swim rather than walk)	Desirable site characteristic		
	Hard/soft river bed bottom	Soft river beds are muddy and may be less popular			

ATTRIBUTE CLUSTERS	ATTRIBUTE (primary attributes in bold)	DESCRIPTION OF PRIMARY ATTRIBUTES	INDICATORS	INDICATOR SIGNIFICANCE THRESHOLDS	DATA SOURCES (AND RELIABILITY)
	Natural jump-off features (e.g., large rock)	Amenity feature			
	Beach	Somewhere to sit and easy access to the water	Desirable site characteristic		
	Pools	Amenity feature			
	Pool/riffle/run sequences	Amenity feature			
	Rapids	Amenity feature			
Water quality	Algae	The presence of blue-green algae (cyanobacteria) presents a public health issue. Draft national guidelines (MfE and MoH, 2009) have been developed – cyanobacteria guideline breaches trigger the posting of public health warnings. Other periphyton (filamentous algae and diatoms) present a nuisance to swimmers and detract from aesthetic appeal (Biggs, 2000) rather than present a potential health issue. This attribute encompasses types of algae that relate to a health risk (cyanobacteria) or a nuisance (filamentous algae/diatoms) for swimmers.	Compliance with national periphyton guidelines and draft national guidelines for cyanobacteria, i.e.: The maximum cover of visible stream or river bed by periphyton: filamentous algae more than 2 cm long shall not exceed 30%; diatoms more than 3 mm thick shall not exceed 60%; or cyanobacteria cover shall not exceed 50%	High: Meet guidelines >50% of the time in past year (score: 3) Medium: Meet guidelines 25-50% of the time in past year (score: 2) Low: Meet guidelines <25% of the time in past year (score: 1)	Expert Panel estimate (fair) Some Council data available (very good)
	Blue-green algae	Covered above – initially separately identified owing to its importance for public health			
	Water clarity	Users prefer clear water	Compliance with ANZECC (2000) guidelines, i.e.: Horizontal visibility >1.6 m (black disc visibility)	High: >3.0 m horizontal visibility when river is below median flow (score: 3) Medium: 1.6-3.0 m horizontal visibility when river is below median flow	Expert Panel estimate (fair) Some Council data available (very good)

ATTRIBUTE CLUSTERS	ATTRIBUTE (primary attributes in bold)	DESCRIPTION OF PRIMARY ATTRIBUTES	INDICATORS	INDICATOR SIGNIFICANCE THRESHOLDS	DATA SOURCES (AND RELIABILITY)
				(score: 2) Low: <1.6 m horizontal visibility when river is below median flow (score: 1)	
	Faecal contaminants	This is related to water clarity and flow (data indicate a positive correlation)			
	pH	Acid or alkaline pH may cause skin irritations and make eyes and cuts sting			
CONTEXTUAL ATTRIBUTES					
Collective value	Site clusters	The proximity of sites to each other may influence site selection, as it provides options (e.g., if one site looks crowded, users can go to a nearby site).			
	Scarcity	Where few swimming sites exist within an area, then each site is more significant			

Appendix 7B-3 Assessment of indicators by SMARTA criteria

Indicator	Specific	Measurable	Achievable	Relevant	Timely	Already in use
Number of swimmers on a peak use day	Yes	Number of swimmers	Requires on-site monitoring	Use implies site valued by user	Data not available (requires monitoring)	Standard recreation metric
Number of kms travelled by swimmers from previous night's location	Yes	Number of km	Requires user survey to identify previous night location	Large travel distance implies high value	Data not available (requires user survey)	Question been asked in recreation surveys
Presence of facilities (toilets; camp facilities - designated camping sites, ablution block, signage, etc)	Yes	Toilet and camp facilities present/absent	Data available for Council facilities; Non-council facilities known by Expert Panel	Facilities respond to demand/high use	Data available	Data used by councils for other purposes
Perception of scenic attractiveness	Yes	Response to user survey rating scale question; Professional assessment by landscape planner	Requires site visit (planner) or else user survey	Likely to influence choice of swimming site	Data not available (but could obtain from site visit – user survey or professional assessment)	Assessments undertaken by landscape planners for other purposes; Question been asked in recreation surveys
Maximum water depth	Yes	Physical measure	Site visit required	Provides swimming hole	Data not available (easy to obtain from site visit)	No
Morphological variability	Yes	Physical measure	Site visit required	Provides site conducive to swimming	Data not available (easy to obtain from site visit)	No
Compliance with periphyton and cyanobacteria guidelines	Yes	National water quality measures	Part of Council monitoring programme	Triggers posting of health risk warning and/or nuisance	Data available	Data used by councils for public health warnings
Compliance with horizontal visibility guidelines	Yes	National water quality measure	Part of Council monitoring programme	Likely to influence choice of swimming site	Data available	Data used by councils for other purposes

Appendix 7B-4 Significance assessment calculations for swimming (Steps 1 and 5-8)

Swimming site	Description	Data	Threshold scores																Sum of threshold scores					River	
			Water clarity	Swim holes	Variable water depth	Algae	Scenic attractiveness	Origin of users	Level of use	Facilities	Water clarity	Swim holes	Variable water depth	Algae	Scenic attractiveness	Origin of users	Level of use	Facilities	Equal wt.	Equal wt.	Level of use x2	Facilities x2	Use+ Facilities x2		Use x3, Facilities x2
	R=rural	Primary attribute:	Horizontal visibility	Max water depth	Morphological variable	G/lines compliance	Overall rating	Km travelled that day	No. swimmers/peak day	Presence facilities	Horizontal visibility.	Max water depth	Morphological variability.	G/lines compliance	Overall rating	Km from home	No. swimmers/peak day	Presence facilities	Score	Rank	Tested & rejected	Tested & rejected	Tested & rejected	Tested & rejected	i.e. Regional
	RR=rural+	Indicator:	1<1.6m, 2=1.6-3m, 3>3.0	1<2m, 2=2-3m, 3>3m	1=low, 2=med, 3=high	1>50%,2=25-50%,3<25%	1=low, 2=mod, 3=high	1<10km,2=10-20km,3>20	1=low,2=med,3=high	1=no, 2=toilet only, 3=camp+ toilet	1<1.6m 2=1.6-3m,3>3m	1<2m,2=2-3m,3>3m	1=low, 2=med, 3= high	1>50%,2=25-50%,3<25%	1=low, 2=mod, 3= high	1<10km ,2=10-20km, 3>20km	1=low,2=med ,3= high	1=no,2=toilet only,3=camp+ toilet							or local
	remote	Thresholds:	TDC data + EP estimate	EP estimate	EP estimate	TDC data + EP estimate.	EP estimate	EP estimate	EP estimate.	TDC data	TDC data + EP estimate	EP estimate	EP estimate	TDC data + EP estimate	EP estimat.	EP estimate	EP estimate	TDC Data							
Takaka River at Paynes Ford	R		3	3	2	3	3	2	3	2	3	3	2	3	3	2	3	2	21	1	24	23	26	29	Regional
Buller River at Riverview Camp, Murchison	R		3	3	3	3	2	1	3	3	3	3	3	2	1	3	3	3	21	1	24	24	27	30	Regional
Lee River Reserve	R		3	2	3	3	2	3	3	2	3	2	3	2	3	3	2	2	21	1	24	23	26	29	Regional
Aorere River at Salisbury Bridge	RR		3	3	3	3	3	3	1	2	3	3	3	3	3	3	1	2	21	1	22	23	24	25	Regional
Motueka River at McLeans Reserve	RR		3	2	3	3	2	3	2	2	3	2	3	2	3	2	2	2	20	5	22	22	24	26	Regional
Roding River at Hackett Reserve	RR		3	2	3	3	2	3	2	2	3	2	3	2	3	2	2	2	20	5	22	22	24	26	Regional
Motueka River at Peninsula Bridge	RR		3	3	3	3	2	3	2	1	3	3	3	2	3	2	1	1	20	5	22	21	23	25	Regional
Takaka River at Blue Hole	RR		3	3	3	3	2	3	1	2	3	3	3	2	3	1	2	2	20	5	21	22	23	24	Regional
Motupiko River at Quinney's Bush	R		3	2	2	3	2	1	3	3	3	2	2	3	2	1	3	3	19	9	22	22	25	28	Regional
Motueka River at Alexanders Bridge	RR		3	2	3	3	2	2	2	2	3	2	3	2	2	2	2	2	19	9	21	21	23	25	Regional
Wainui River at falls track	RR		3	2	3	3	3	2	2	1	3	2	3	3	3	2	2	1	19	9	21	20	22	24	Regional
Roding River at White Gates	RR		3	2	3	3	2	3	1	2	3	2	3	2	3	1	2	2	19	9	20	21	22	23	Regional
Aorere River at Devils Boots	R		3	3	3	3	3	2	1	1	3	3	3	3	3	2	1	1	19	9	20	20	21	22	Regional
Roding River at Twin Bridges	R		3	1	2	3	2	3	3	2	3	1	2	3	2	3	3	2	19	9	22	21	24	27	Regional
Buller River at Motorhome Park	R		3	3	2	3	2	1	1	3	3	3	2	3	2	1	1	3	18	15	19	21	22	23	Local
Waingaro River upstream Takaka			3	2	2	3	2	1	2	3	3	2	2	3	2	1	2	3	18	15	20	21	23	25	Local
Wairoa River at WEIS Weir	R		3	2	2	3	2	2	3	1	3	2	2	3	2	2	3	1	18	15	21	19	22	25	Local
Motueka River at Blue Hole			3	3	2	3	2	2	2	1	3	3	2	3	2	2	1	1	18	15	20	19	21	23	Local
Motueka River - Mcleans to Woodstock	RR		3	2	2	3	2	3	2	1	3	2	2	3	2	3	2	1	18	15	20	19	21	23	Local
Riwaka River at North Branch source			3	1	2	3	3	3	1	2	3	1	2	3	3	3	1	2	18	15	19	20	21	22	Local
Lee River at Mead Reserve	R		3	2	2	3	2	3	1	2	3	2	2	3	2	3	1	2	18	15	19	20	21	22	Local
Lee River at Firestone			3	2	2	3	2	3	1	2	3	2	2	3	2	3	1	2	18	15	19	20	21	22	Local
Buller River at Owen River Camp	RR		3	3	3	3	2	1	1	2	3	3	3	2	1	1	2	2	18	15	19	20	21	22	Local
Motueka River at Gravel Pit/Greg's Rock			3	2	3	3	2	3	1	1	3	2	3	2	3	1	1	1	18	15	19	19	20	21	Local
Wairoa River at DOC Reserve (d-s left & right branch confluence)	RR		3	2	3	3	2	3	1	1	3	2	3	2	3	1	1	1	18	15	19	19	20	21	Local
Torrent River at Cleopatras Pool			3	1	2	3	3	3	2	1	3	1	2	3	3	3	2	1	18	15	20	19	21	23	Local

Motueka River - SH60 to Alexander Br	RR		3	2	3	2	2	2	2	2	1	3	2	3	2	2	2	2	1	17	27	19	18	20	22	Local
Motueka River at Durants			3	2	2	3	2	2	2	2	1	3	2	2	3	2	2	2	1	17	27	19	18	20	22	Local
Motueka River - Alexander to Peninsula Br	RR		3	2	2	3	2	2	2	2	1	3	2	2	3	2	2	2	1	17	27	19	18	20	22	Local
Motueka River at Hadlees			3	2	2	3	2	2	2	2	1	3	2	2	3	2	2	2	1	17	27	19	18	20	22	Local
Motueka River at Tinpot			3	2	2	3	2	2	2	2	1	3	2	2	3	2	2	2	1	17	27	19	18	20	22	Local
Motueka River at Jenkins			3	2	2	3	2	2	2	2	1	3	2	2	3	2	2	2	1	17	27	19	18	20	22	Local
Takaka River at SH60	R		3	2	2	3	2	2	1	2	2	3	2	2	3	2	2	1	2	17	27	18	19	20	21	Local
Motueka River at Pokororo			3	2	2	3	2	2	1	2	2	3	2	2	3	2	2	1	2	17	27	18	19	20	21	Local
Abel Tasman NP along Track			3	1	2	3	2	3	2	1	2	3	1	2	3	2	3	2	1	17	27	19	18	20	22	Local
Tukurua Stream at mouth	R		3	1	1	3	2	1	2	3	2	3	1	1	3	2	1	2	3	16	36	18	19	21	23	Local
Motueka River SH60 Bridge	R		3	2	3	2	1	1	3	1	2	3	2	1	1	3	1	3	1	16	36	19	17	20	23	Local
Motueka River at Gorge	RR		3	1	2	3	2	3	1	1	2	3	1	2	3	2	3	1	1	16	36	17	17	18	19	Local
Owen River at Owen River Camp			3	2	2	3	2	1	1	2	2	3	2	2	3	2	1	1	2	16	36	17	18	19	20	Local
Waimea River at Appleby Bridge	R		3	1	2	3	1	1	2	2	2	3	1	2	3	1	1	2	2	15	40	17	17	19	21	Local
Motueka River at Tapawera	R		3	1	2	3	1	1	1	3	2	3	1	2	3	1	1	1	3	15	40	16	18	19	20	Local
Motueka River at Blue Gums			3	2	2	2	2	1	2	1	2	3	2	2	2	2	1	2	1	15	40	17	16	18	20	Local
Anatoki River at Happy Sams	R		3	2	2	3	2	1	1	1	2	3	2	2	3	2	1	1	1	15	40	16	16	17	18	Local
Aorere River at Collingwood-Pakawau Rd			3	2	2	3	2	1	1	1	2	3	2	2	3	2	1	1	1	15	40	16	16	17	18	Local
Marahau River at Old MacDonalds Farm			2	1	1	3	2	1	2	3	2	2	1	1	3	2	1	2	3	15	40	17	18	20	22	Local
Marahau River at camp u-s Old MacDonalds Farm			2	1	1	3	2	1	2	3	2	2	1	1	3	2	1	2	3	15	40	17	18	20	22	Local
Motueka River at Whakarewa St (Blue Rk)			3	2	2	2	1	1	2	1	2	3	2	2	2	1	1	2	1	14	47	16	15	17	19	Local
Motueka River at Pah St (Red Rock)			3	2	2	2	1	1	2	1	2	3	2	2	2	1	1	2	1	14	47	16	15	17	19	Local
Motueka River at Elephant Rk (Woodmans Bend)			3	2	2	2	1	1	2	1	2	3	2	2	2	1	1	2	1	14	47	16	15	17	19	Local
Waimea River - SH60 to Bryants			3	1	2	3	1	1	2	1	2	3	1	2	3	1	1	2	1	14	47	16	15	17	19	Local
Wairoa River at Bryants Rd	R		3	1	2	3	1	1	2	1	2	3	1	2	3	1	1	2	1	14	47	16	15	17	19	Local
Takaka River at Kotinga (pony club)			3	1	2	3	2	1	1	1	2	3	1	2	3	2	1	1	1	14	47	15	15	16	17	Local
Anatoki River at One Spec Rd			3	1	2	3	2	1	1	1	2	3	1	2	3	2	1	1	1	14	47	15	15	16	17	Local
Wai-iti River at Waimea West Rd	R		3	1	2	3	1	1	2	1	2	3	1	2	3	1	1	2	1	14	47	16	15	17	19	Local
Waimea River at Bartletts	R		3	1	2	3	1	1	1	1	2	3	1	2	3	1	1	1	1	13	55	14	14	15	16	Local
Waimea River at Blackbyre Rd	R		3	1	2	3	1	1	1	1	2	3	1	2	3	1	1	1	1	13	55	14	14	15	16	Local
Wairoa River at Clover Rd	R		3	1	2	3	1	1	1	1	2	3	1	2	3	1	1	1	1	13	55	14	14	15	16	Local
Takaka River at Reilly's Rd			3	1	1	3	1	1	1	1	2	3	1	1	3	1	1	1	1	12	58	13	13	14	15	Local
Brooklyn Stm at Westbank Rd			3	1	1	3	1	1	1	1	2	3	1	1	3	1	1	1	1	12	58	13	13	14	15	Local
Riwaka River at SH60			3	1	1	3	1	1	1	1	2	3	1	1	3	1	1	1	1	12	58	13	13	14	15	Local
Wai-iti River at Pidgeon Valley Rd (Wakefield)	R		3	1	1	3	1	1	1	1	2	3	1	1	3	1	1	1	1	12	58	13	13	14	15	Local
Motupipi River at Abel Tasman Dr	R		1	2	2	2	1	1	1	1	2	2	2	2	2	1	1	1	1	11	62	12	12	13	14	Local

Appendix 7B-5

Other factors relevant to the assessment of significance for swimming (Step 9)

Desirable site characteristics for swimming
<p>Public access The public must be able to access the site. Access for vehicles is important for most sites and includes space for parking (which may be informal). It was noted that access to most swimming sites is free of charge in New Zealand and this is expected by New Zealanders.</p>
<p>Flow (velocity) The water should be flowing (not stagnant) and able to be waded (<1 m/s at 1 m depth).</p>
<p>River width A river that is too narrow is unlikely to attract swimmers - a width of approximately >5 m was suggested.</p>
<p>Perception of safety Swimmers are unlikely to use a site they consider too risky.</p>
<p>Beach Ideally, the shore provides somewhere to sit and enables easy access to the water.</p>
Other factors
<p>Potential future use Some sites may receive a low level of existing use (or none at all) but have the potential to be well-used swimming sites (e.g., from a change to a desirable site characteristic).</p>
<p>Degree of scarcity of the experience Where few alternative (substitute) sites exist that suit swimming, then the degree of scarcity is high (and vice versa). This places greater significance upon sites. Conversely, where sites exist in close proximity, this may influence site selection as it provides options (e.g., if one site looks crowded, users can go to a nearby site).</p>

Appendix 7B-6

Future data requirements for swimming (Step 10)

Data need
User monitoring at swimming sites on peak use days – numbers of users
Professional assessment of scenic attractiveness by landscape planner
User surveys at swimming sites (home location; perception of scenic attractiveness; use by different ethnic groups; satisfaction with visit)
Population-based survey (in conjunction with other recreation data collection) - to enable calculation of swimmer/days + evaluation of the overall importance of different sites for swimming