Whitebaiting:
Application of the River Values Assessment System (RiVAS)

Prepared by:
Kay Booth
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Chapter 1
Introduction

Purpose

This report applies the River Values Significance Assessment Method (RiVAS) outlined in *River Values Assessment System (RiVAS) – The Method* (Hughey et al., 2010), and should be read in conjunction with that chapter. Its purpose is to describe how to apply the method to the activity of whitebaiting. At the time of writing, the method had not been applied to any region although it has been applied to three rivers for demonstration purposes. It is expected that when this regional application occurs, some further revisions will be undertaken to the method outlined in this report.

Preparatory step: Establish an expert panel and identify peer reviewers

The National Expert Panel for whitebaiting comprised Martin Rutledge, Chris Tonkin and Dave West. Dave West was unable to attend the workshop: he provided reference material prior to the workshop and reviewed the report after the workshop. The peer reviewer was Mike Hickford. Kay Booth facilitated the case study. Credentials of the Expert Panel, peer reviewer and facilitator are provided in Appendix 1.

Chapter 2
Application of the method

Step 1: Define river value categories and river segments

River value categories

Expert Panel discussion identified that whitebaiting is very different in nature to fishing for other native species, notably eeling and floundering. For the purposes of this analysis, there was considered to be little difference between angling for different whitebait species. Whitebaiting has recreational, pecuniary/barter and customary dimensions. Whitebaiters cannot be easily pigeon-holed (e.g., a recreational whitebaiter might sell excess catch) and the Panel agreed this exercise could cover them all. It was noted that the means of catching whitebait varies between commercial and recreational whitebaiters (e.g., few commercial whitebaiters use a scoop net), by geographical area (e.g., scoop nets are rarely used in Southland's deep slow-moving rivers) and even within a river (e.g., blind-trawling may occur at the river mouth, scoop netting over spotter boards within mid-reaches, with set-netting upstream). Furthermore, it was noted that whitebaiting mainly occurs within tidal reaches. West Coast whitebaiting regulations (Department of Conservation 2010) restrict the activity to tidal reaches, although the regulations that apply to the rest of New Zealand and the Chatham Islands allow the activity to take place anywhere whitebait are found (Department of Conservation 2003).

River segments

Because the method has yet to be applied in any region, the Expert Panel selected three South Island rivers to provide a preliminary test of the method (see Appendix 2). Following the standard RiVAS approach, if a reach is not included in the whitebaiting assessment, it is assumed to hold no or negligible value for whitebaiting, or to be of local significance.

Expert Panel composition

The Expert Panel noted that whitebaiters tend to be very secretive and it may be difficult to find whitebaiters who are willing to contribute to a RiVAS assessment. Local Department of Conservation (DOC) staff should be asked whether they know of any who could assist. Staff from DOC and the relevant Fish and Game Council and regional council could form the Expert Panel for application of the whitebaiting method with local whitebaiters (where available). The West Coast Whitebaiting Association should be involved for any application in Westland.

Outcomes

Treat whitebaiting as one river value (with no separate categories).

Step 2: Identify attributes

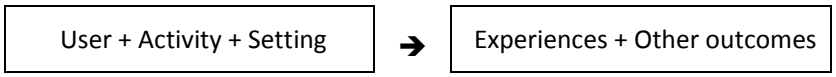
In identifying attributes for whitebaiting, consideration was given to the attributes developed for salmonid angling, and then particular characteristics of whitebaiting were discussed.

Similar to other recreational river values, whitebaiting attributes consider various aspects of the Recreation Opportunity Spectrum (ROS) framework and include:

1. *Existing use attributes* based on the dimensions of the 'recreation opportunity', which is defined as: a chance for a *person* to participate in a specific recreational *activity* within a specific *setting*,

in order to achieve a recreational *experience*, with other *outcomes* also realised (positive benefits and negative impacts which may accrue to the recreationist, their group, local communities, or the nation)[1] (Figure 1).

Figure 1
Framework for existing use attributes



Appendix 3 includes attributes associated with the user and the activity (level of use, origin of users), the setting (see next), the experience (perception of river importance) and attributes associated with other outcomes (importance for commercial whitebaiting). The recreation setting is considered in terms of the three setting components of the ROS: environmental parameters (water quality/aesthetics), social parameters (social conflict and crowding) and managerial parameters (access to and along the river).

2. *Contextual attributes* which consider the river in its wider geographical context – its role within the *spectrum* of recreation settings (c.f. existing use attributes that are specific to the river itself). This set of values derives from the ROS premise that quality recreational experiences are best achieved by providing a range or diversity of recreation opportunities[2]. Given the regional (rather than river) scale of these attributes, they will be addressed in Step 9.

   Many whitebaiters are 'river faithful'. This attribute is most relevant for itinerant whitebaiters and those fishing for pecuniary reasons: both may seek rivers providing big catches, for example.

3. *Future and past use attributes* are identified because the notion of a 'recreation opportunity' highlights the chance or opportunity to undertake recreation – it is not restricted to opportunities that have been taken up (existing use). Given the conceptual nature of these attributes, they will be considered in Step 9.

Outcome

A list of all attributes is provided in Appendix 3.

Step 3: Select and describe primary attributes

From the list of attributes outlined in Step 2, primary attributes were selected to *represent* whitebaiting. Selection was based on:

1. The need for pragmatism – only seven attributes were identified but these covered three of the four well-beings;
2. Expert Panel members' opinion about the contribution of attributes to an understanding of whitebaiting was used. No research on the attributes identified as important by whitebaiters is available;
3. Focus upon the parameters that relate to the specific river rather than the role of the river within the wider context (the recreation opportunity spectrum contextual attributes). This decision was made for practical reasons – not because contextual factors were considered less important;
4. Coverage of the following dimensions of the ROS framework, as these were considered the most important: users, environmental setting, experiences;

1 Adapted from Stankey and Wood (1982) and Driver (2009)

2 McCool et al. (2007)

5. 'Experiences' attributes, which focus upon the *overall* perceptions of users. There are many experiential attributes which have been ignored for practical reasons, e.g., a whitebaiter's enjoyment of solitude; and
6. Existing data – consideration was not given to the availability of existing data, as later steps account for data deficiency and provide for input into future research needs (to overcome data deficiencies in the future).

Outcome

Appendix 3 identifies the seven primary attributes (in bold) and describes them, with emphasis on explanation of the attribute's validity and reliability as a representative measure of whitebaiting.

Step 4: Identify indicators

One indicator for each primary attribute was identified, using SMARTA criteria, based on:

1. Expert Panel judgement – few existing data were identified for whitebaiting. Work in advance of the meeting to collate existing data identified an inventory of South Island whitebaiting rivers (Kelly 1988) and a more recent review of the West Coast whitebait fishery (Sutherland n.d.). A report based on the national inanga spawning database (Taylor 2002) and a recent conference presentation (West et al. 2010) provided additional material; and
2. Indicator portability – based on an attempt to identify indicators that have already been used for other river recreational values (e.g. 'level of use' and 'origin of users').

Appendix 4 shows the assessment of each indicator on SMARTA criteria.

Each indicator was considered carefully:

Level of use: Ideally this metric should be 'total number of whitebaiter days p.a.' (per season is problematic as seasons vary across the country). Given the lack of data, the Expert Panel decided more accurate estimates could be provided for average daily usage (i.e. on average for the season, what number of whitebaiter visits would be expected for the river per day). Each visit during the day (for different tides) should be counted separately.

The Expert Panel developed the following scale, noting that it should be reassessed when the whitebaiting method was applied, as there were very few data on which to base these thresholds:

1. Low level of use: <10 whitebaiter visits per day.
2. Moderate level of use: 10-49 whitebaiter visits per day.
3. High level of use: 50+ whitebaiter visits per day.

An alternative indicator is the 'number of whitebaiters on a peak use day'. It is suggested that both metrics are used in the first full application of the whitebaiting method and a judgement made about which indicator gives greatest utility.

Importance for commercial whitebaiting: This indicator focuses upon commercial importance irrespective of means of fishing. Regional council data, where available, on the number of consented whitebait stands would inform this indicator (and should be collated), but these data do not measure whitebaiting activity undertaken with set or scoop nets (i.e., where there is no permanent structure). Therefore, the metric is an estimate of importance using the Expert Panel's knowledge on a 5-point scale that ranges from 1= Not at all important, to 5= Very important. In this way, the Expert Panel will focus upon overall commercial importance, rather than only distinguishing rivers with and without consented structures.

Origin of users: The greater the distance travelled to fish a river the greater the whitebaiting value of that river. The indicator is measured using the same scale as the RiVAS whitewater kayaking method (Booth et al. 2010)[3]:

1. Within district (live within territorial authority boundary in which river is located).
2. Within region (regional council boundary) but outside home district.
3. Neighbouring region (home region borders region in which river is located).
4. Rest of New Zealand beyond neighbouring regions.
5. International.

A threshold of 10% of users from the district/region was chosen to trigger the rank (e.g., ≥10% of users from districts within the region but not the same district as that in which the river is located would receive a '2'). In the absence of any data, estimates from the Expert Panel will be required.

Access to and along the river: A positive relationship between ease of access to the fishing site and whitebaiting value is assumed. While difficult access would limit the number of whitebaiters and this may be viewed positively by whitebaiters, the next indicator accounts for the influence of others on the whitebaiting experience. Access relates to the physical ability to get to and move along the river, rather than the legal right of access (which is covered in Step 9). Easy access is characterised by 2WD access to, or close to, the fishing site. Difficult access is characterised by a lack of 2WD access requiring a walk of up to 30 minutes or use of a boat, helicopter or 4WD motorbike. Because a river mouth changes (owing to floods etc.), the average accessibility over the past ten years should be measured. The indicator is an estimate of accessibility using the Expert Panel's knowledge on a 5-point scale that ranges from 1= Very difficult access, to 5= Very easy access.

Social conflict and crowding: Conflict and crowding amongst whitebaiters decreases the whitebaiting experience: an inverse relationship exists between this indicator and whitebaiting value. The metric is the whitebaiter's perception of crowding (perception that there are too many other whitebaiters) and conflict (adverse perception of other whitebaiters more generally, e.g., related to aggressive or noisy behaviour). Crowding is about the user's *perception* of the number of other whitebaiters not simply the actual number of people (user density). In the absence of survey data, the indicator is an estimate of social conflict and crowding using the Expert Panel's knowledge on a 5-point scale that ranges from 1= Very high level of conflict and crowding, to 5= Very low level of conflict and crowding.

Crowding is one manifestation of social conflict but is specifically highlighted in this indicator because it is a known problem at some whitebaiting sites. Social conflict may take various forms (crowding, unpleasant behaviour, unfriendliness, etc.) and can be managed (e.g., local informal spacing rules or registered stands may help to facilitate high user densities while keeping perceptions of crowding low). In other words, crowding may not exist in all situations of high use density. The Panel felt all aspects of social conflict (including crowding) could be subsumed into one indicator.

Perceptions of the overall importance of the river: Many aspects of the whitebaiting experience are covered by this attribute, such as personal or cultural attachment to the site (e.g., nohoanga sites) and scenic attractiveness. In the absence of survey data, the indicator is an estimate of overall importance of the river to whitebaiters using the Expert Panel's knowledge on a 5-point scale that ranges from 1= Very low overall importance, to 5= Very high overall importance.

Perceptions of water quality and aesthetics: Water-related factors influence whitebaiting value, including water clarity, and the presence of contaminants, floating debris and algae. Water quality

3 http://www.lincoln.ac.nz/Documents/LEaP/LEaPNo24/Chap-6-Part-B-WhitewaterKayakingTasman.pdf

alone is not an appropriate indicator (e.g., some popular whitebaiting sites are immediately below sewer outflows). This attribute could be measured by an environmental factor or users' perception. Given its multifarious nature, users' perception was favoured as the measure. In the absence of any data, the indicator is an estimate of water quality and aesthetics using the Expert Panel's knowledge on a 5-point scale that ranges from 1= Very poor, to 5= Very good. National benchmarks were suggested to be: 5= Pristine West Coast river; 1= Manawatu River and the lower reaches of the Waikato River.

Outcome

Indicators are listed in Appendix 3 and assessed against SMARTA criteria in Appendix 4.

Step 5: Determine indicator thresholds

The thresholds are given in Appendix 3 and may be summarised as:

1. Where a 5-point scale was used to measure the indicator (e.g., *Access to and along the river*), indicator scores were assigned to thresholds as follows:

   High (3) = 4 or 5 score
   Moderate (2) = 3 score
   Low (1) = 1 or 2 score

2. *Origin of users:* An exception to the 5-point scale application, as follows:

   High (3) = Rest of New Zealand, or International.
   Moderate (2) = Within region, or From neighbouring region.
   Low (1) = Within district.

3. *Level of use (whitebaiter visits per day):* Thresholds were:

   High (3) = 50+
   Moderate (2) = 10-49
   Low (1) = <10

Outcome

Thresholds are identified in Appendix 3.

Step 6: Apply indicators and indicator thresholds

Owing to a lack of data, all indicators were assessed using Expert Panel estimates.

Outcome

Estimates were entered into the spreadsheet shown in Appendix 2.

Step 7: Weighting the primary attributes

The Expert Panel reviewed the seven primary attributes and considered whether some made a relatively greater contribution to whitebaiting as a whole. Initial thoughts were that they made an equal contribution. This should be tested during early applications of the whitebaiting method.

Outcome

Equal weighting.

Step 8: Determine river significance

Step 8a: Rank rivers

The spreadsheet was used to sum the indicator threshold scores for each river. Since we had chosen to equally weight the primary attributes, we did not have to first multiply the threshold scores by the weights.

Step 8b: Identify river significance

The Expert Panel discussed the best way to identify significance. This was a theoretical discussion, because the method had been applied to only three rivers. Intuitively the Panel preferred the cut-off point approach because no obvious national trigger attribute presented itself. Thresholds should be chosen during the first application of the whitebaiting method, with consideration to thresholds appropriate nationally.

Outcome

A list of three rivers ranked by the scoring system as an initial test of the method. See Appendix 2.

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

Seven attributes of whitebaiting have been identified that are not quantifiable but considered relevant to significance assessment. These attributes are discussed in Appendix 5 in order to highlight their importance to a meaningful understanding of whitebaiting. The attributes are:

- Legal access;
- Degree of scarcity of the experience;
- Contribution to a collective value;
- Users' perceptions of the river's 'status';
- Potential future use;
- Past use (former high quality whitebaiting rivers); and
- Cultural values.

While these factors might be considered part of the attribute '*Perceptions of the overall importance of the river*', the Expert Panel felt that they required explicit acknowledgement because they are relevant to decision-making about whitebaiting.

Outcome

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

Step 10: Review assessment process and identify future information requirements

Few data are available to inform assessments of whitebaiting. Desired data are noted in Appendix 6. Updating Kelly (1988), which provides an inventory of South Island whitebaiting rivers, would be very useful, as would preparation of an equivalent assessment for the North Island.

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Appendix 1
Credentials of the Expert Panel members, Peer Reviewer and Advisor

The Expert Panel comprised three members. Their credentials are:

1. **Chris Tonkin** was the manager of the West Coast Fish and Game Region for 16 years and prior to that a field officer for the Westland Acclimatisation Society for 12 years. He is now a contracted Regional Field Advisor for the New Zealand Walking Access Commission. He is a keen whitebaiter.
2. **Martin Rutledge** is a freshwater ecologist based with the Department of Conservation in Nelson.
3. **Dr Dave West** is a Science Advisor (Freshwater) with the Department of Conservation. He was a corresponding member of the Expert Panel, as he was unable to attend the workshop.

Peer reviewer for this work was:

4. **Dr Mike Hickford** is a Research Biologist within the School of Biological Sciences, University of Canterbury. His research specialty is the whitebait fishery and restoration of inanga spawning habitat and he is Principal Investigator on a Ministry of Business, Innovation and Employment funded research project to NIWA tasked with developing tools for rehabilitation of aquatic habitats. He is a keen whitebaiter.

Advisor and facilitator:

5. **Dr Kay Booth** of Lindis Consulting was the facilitator. Kay has been involved in developing the RiVAS tool since its inception in 2007, and has applied RiVAS to various river values for several regional councils.

Appendix 2
Significance assessment calculations for whitebaiting – 3 test rivers (Steps 1 and 5-8)

	Step 6A: Apply indicators and thresholds							Step 6B: Apply indicators and thresholds							Step 8: River value	
River	**Threshold scores - RiVAS (current conditions)**							**Threshold scores - RiVAS (current conditions)**								
	Level of use	Importance for commercial whitebaiting	Origin of users	Access to and along river	Social conflict & crowding	Perception of river importance	Perception of water quality & aesthetics	Level of use	Importance for commercial whitebaiting	Origin of users	Access to and along river	Social conflict & crowding	Perception of river importance	Perception of water quality & aesthetics	**Sum**	**Significance**
	Whitebaiter visits per day	Rating scale (Expert Panel assessment)	User catchment	Rating scale (Expert Panel assessment)	Rating scale (fisher's assessment)	Rating scale (fisher's assessment)	Rating scale (Expert Panel assessment)	Whitebaiter visits per day	Rating scale (Expert Panel assessment)	User catchment	Rating scale (Expert Panel assessment)	Rating scale (fisher's assessment)	Rating scale (fisher's assessment)	Rating scale (Expert Panel assessment)	Equal weights	
	(n)	1=not at all important, to 5=very important	1=within district, 2=within region, 3=neigh-bouring region, 4=rest of NZ, 5=int'l	1=very difficult, to 5=very easy	1=very high level, to 5=very low level	1=very low, to 5=very high	1=very poor, to 5=very good	(1)=1-10, (2)=11-49, (3)=50+	(1)=1 or 2, (2)=3, (3)=4 or 5	(1)=1, (2)=2 or 3, (3)=4 or 5	(1)=1 or 2, (2)=3, (3)=4 or 5	(1)=1 or 2, (2)=3, (3)=4 or 5	(1)=1 or 2, (2)=3, (3)=4 or 5	(1)=1 or 2, (2)=3, (3)=4 or 5	Equal weights	
Motueka River	50+	3	2	5	3	3	5	3	2	2	3	2	2	3	17	National
Maitai River	10	1	1	5	5	2	3	1	1	1	3	3	1	2	12	Local
Okuru River	50+	5	3	3	3	5	5	3	3	2	2	2	3	3	18	National

Appendix 3
Assessment criteria for whitebaiting (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: Select and describe primary attributes		Step 3: Select and describe primary attributes	Step 4: Identify indicators	Step 5: Determine significance thresholds	
ATTRIBUTES ASSOCIATED WITH EXISTING USE					
Users	**Level of use**	High use implies high value. However, this assumption will under-value places with no access or difficult access, and remote/ wilderness areas that offer few encounters with other people (other whitebaiters represent not only a potential disturbance to wilderness values, but also competition for river space and fish).	No. of whitebaiter visits per day on average over the season Notes: Ideally should be total no. of whitebaiter days p.a. However, the Expert Panel decided more accurate estimates could be provided for average daily usage.	High: 50+ whitebaiter visits per day (**score: 3**) Moderate: 10-49 whitebaiter visits per day (**score: 2**) Low: <10 whitebaiter visits per day (**score: 1**)	Expert panel estimate (fair)
	Spatial intensity of use				
	Level of recreational use				
	Level of customary use				
	Level of commercial use	This attribute is about numbers of commercial users and differs from importance of the river to commercial whitebaiting (see later).			

	Origin of users	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 threshold of 10% of users from the district/region was chosen to trigger the rank (e.g., ≥10% of users from districts within the region but not the same district as that in which the river is located would receive a '2').	Distance travelled from whitebaiter's home district/ region: 1=within district, 2=within region, 3=neighbouring region, 4=rest of NZ, 5=int'l	High: Rest of New Zealand, or International (**score: 3**) Moderate: Within region, or From neighbouring region (**score: 2**) Low: Within district (**score: 1**)	Expert panel estimate (fair)
	User demographics				
Environmental setting	Anticipated chance of a big catch				
	Fish abundance				
	Water quality and aesthetics	Water-related factors influence whitebaiting value, including water clarity, and the presence of contaminants, floating debris and algae. Given its multifarious nature, users' perception was favoured as the measure over the use of several environmental factors.	Whitebaiter's perception of water quality and aesthetics. Expert Panel estimate (5-point rating sale): 1=very poor to 5=very good	High: Very high water quality and aesthetic value (**score: 3**) Moderate: Moderate water quality and aesthetic value (**score: 2**) Low: Very low water quality and aesthetic value (**score: 1**)	Expert Panel estimate (fair)
	Scenic attractiveness				
	Wilderness character				

Social setting	**Encounters with other whitebaiters: social conflict and crowding**	Conflict and crowding decreases the whitebaiting experience: an inverse relationship exists between this indicator and whitebaiting value.	Whitebaiter's perception of crowding (perception of the number of other whitebaiters) and conflict (perception of other whitebaiters generally). Expert Panel estimate (5-point rating sale): 1=very high level of conflict and crowding to 5= very low level of conflict and crowding	High: Very low level of conflict and crowding (**score: 3**) Moderate: Moderate level of conflict and crowding (**score: 2**) Low: Very high level of conflict and crowding (**score: 1**)	Expert Panel estimate (fair)
	Encounters with other users (not whitebaiters)				
	Safety (river mouths particularly risky)				
	Availability of complementary activities				
Managerial setting	**Access to and along the river**	A positive relationship between ease of access to the fishing site and whitebaiting value is assumed. While difficult access would limit the number of whitebaiters and this may be viewed positively by whitebaiters, the next indicator accounts for the influence of others on the whitebaiting experience. 'Access to fishing site' relates to the physical ability to get to and move along the river, rather than the legal right of access (which is covered in Step 9). Because a river mouth changes (owing to floods etc.), the average accessibility over the past ten years should be measured.	Expert Panel's assessment of accessibility (5-point rating scale): 1=lack of 2WD access requiring a walk of up to 30 minutes or use of a boat, helicopter or 4WD motorbike to 5=2WD access to, or close to, the fishing site	High: Very easy access (**score: 3**) Moderate: Moderate access (**score: 2**) Low: Very difficult access (**score: 1**)	Expert Panel estimate (good)

	Legal access	See Step 9.			
Experiences	**Perceptions of the overall importance of the river**	A survey of whitebaiters could ask them to rate rivers in terms of their overall importance for whitebaiting.	Whitebaiters' perception of the overall importance of the river for whitebaiting. Expert Panel estimate (5-point rating sale): 1=very low rating of the river's overall importance to 5=very high rating of the river's overall importance	High: High rating of river importance (**score: 3**) Moderate: Moderate rating of river importance (**score: 2**) Low: Low rating of river importance (**score: 1**)	Expert Panel estimate (fair)
	Place attachment				
	Perceptions of the quality of the experience				
Other outcomes	**Importance for commercial whitebaiting**	This attribute is a judgement of importance. The number of consented whitebait stands provides useful data to inform the assessment but does not cover all styles of whitebaiting. Kelly (1988) commercial data is still helpful although out of date.	The Expert Panel's perception of the importance of the river for commercial whitebaiting. Expert Panel estimate (5-point rating sale): 1= not at all important to 5=very important	High: High rating of commercial importance (**score: 3**) Moderate: Moderate rating of commercial importance (**score: 2**) Low: Low rating of commercial importance (**score: 1**)	Expert Panel estimate (good)
	Economic benefits: To local area, region, nation				

	Non-economic benefits, including whitebaiting as 'Kiwi culture'	See Step 9.			
CONTEXTUAL ATTRIBUTES					
Opportunity *spectrum*	Degree of scarcity of the experience	See Step 9.			
	Contribution to a collective value	See Step 9.			
	Users' perceptions of the river's 'status'	See Step 9.			
ATTRIBUTES ASSOCIATED WITH FUTURE AND PAST USE					
Recreation *opportunity*	Potential future whitebaiting use (option value) - avoid precluding future uses	See Step 9.			
	Past use (former glory)	See Step 9.			
	Self limit	In order to protect the fishery, whitebaiters may limit their take			

Appendix 4
Assessment of indicators by SMARTA criteria (Step 4)

Indicator	Specific	Measurable	Achievable	Relevant	Timely	Already in use
No. whitebaiter visits per day	Yes	No. visits	No data available - estimate required	Use implies valued by user	Yes	Yes: common measure of recreation use
Estimate of importance of the river for commercial whitebaiting	Yes	Expert Panel's rating	No data available - estimate required	High commercial importance implies high value	Yes	No
Distance travelled from home by whitebaiters	Yes	Response to survey question	No data available - estimate required	Travel distance is an indicator of river's importance	Yes	Yes: RiVAS whitewater kayaking method
Access to and along the river	Yes	Expert Panel's rating	No data available - estimate required	Influences choice of fishing site and ability to get to site and move along river	Yes	No
Perception of water quality and water aesthetics	Yes	Expert Panel's rating	No data available - estimate required	Influences choice of fishing site, ability to catch fish and quality of the experience	Yes	No
Whitebaiters' perceptions of social conflict and crowding	Yes	Response to rating scale survey question	No data available - estimate required	Influences choice of fishing site, ability to fish there and quality of the experience	Yes	Yes: common recreation measure
Whitebaiters' perceptions of the overall importance of the river	Yes	Response to rating scale survey question	No data available - estimate required	Influences choice of fishing site	Yes	Yes: RiVAS salmonid angling method

Appendix 5
Other factors relevant to the assessment of significance for whitebaiting (Step 9)

Legal access
Legal access (the right to be on land) is a prerequisite for whitebaiting. Access provision influences the pattern of existing use - lack of legal access may limit or completely restrict use, even to otherwise suitable sites.
Context
An individual river may have values that relate to its contribution to the regional collective. These may have important benefits to the region but are difficult to quantify. This includes several parameters: **Degree of scarcity of the experience** Where few alternative (substitute) sites exist that will satisfy the recreation experience being sought (e.g. high yielding whitebait river), then the degree of scarcity is high (and vice versa). This notion has parallels with the biodiversity rarity argument – protection of the rare and endangered species. So too, for recreation opportunities – protection of the recreation opportunities that are most scarce. **Contribution to a collective value** Individual sites may contribute to a set of values found within a region – the sum may be greater than the parts. If parts of the collective are compromised, this may act as a 'tipping point' to reduce or negate the value of the collective. For example, whitebaiters may travel a long distance to an area because it has a large number of whitebait rivers. This argument mirrors biodiversity hot spots of endemism – hot spots for whitebaiting may occur that require protection. **Users' perceptions of the river's 'status'** While more nebulous, fishers may rate a river as one of, for example, the top three best fishing areas in New Zealand.
Potential future use
This is about the potential to undertake fishing at that place in the future. The goal is to avoid precluding future recreational use. The Recreation Opportunity Spectrum is predicated on the notion of the recreation opportunity rather than recreational use. An opportunity is just that – the *potential* to undertake a recreational activity - which may be currently taken up (or not). This factor is therefore about potential, but not yet realised, opportunities. There are a variety of reasons why recreation opportunities may not be realised. Recreation is subject to rapid developments in technology and changing social preferences. Changes in access similarly may alter use. As a result, dramatic changes in use patterns can occur and existing use patterns may be poor indicators of future use value. 'Future proofing' for potential recreational value is required. Some decisions may inadvertently preclude future recreational options. The goal is to avoid this outcome.
Past use
This value is also non-quantifiable and is associated with important past uses of a river. With respect to whitebaiting, former 'renowned' whitebait fisheries are relevant.
Cultural values
Cultural value relates to various aspects of whitebaiting, such as its importance to tangata whenua and its place within Kiwi culture more generally. It includes 'existence value' which is about knowing that a resource exists and that the present generation will pass it on to the next generation (in a healthy state suitable for fishing).

Appendix 6
Future data requirements for whitebaiting (Step 10)

Data need
Identification of factors important for whitebaiting (attribute verification)
Number of whitebaiter visits per day or number of whitebaiter days p.a.
Amount of whitebaiting effort that is commercial
Origin of whitebaiters
Assessment of site access
Whitebaiters' perceptions of conflict and crowding at the fishing site
Whitebaiters' evaluation of the overall importance of rivers for whitebaiting
Whitebaiters' perception of water quality and aesthetics
Role of whitebaiting as a cultural pursuit