

# THE TRANSFER OF WATERS WITHIN A CATCHMENT & BETWEEN CATCHMENTS

A DECISION FRAMEWORK TO ASSIST IN ASSESSING  
THE CULTURAL IMPACT OF WATER TRANSFERS



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June 2018



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# Acknowledgements

This report is prepared under NIWA's Sustainable Water Allocation Programme.



# 01

## INTRODUCTION

### 1.1 Background

New Zealand is approaching some water resource limits, which can be seen in areas with deteriorating water quality, water demand outstripping supply, and constrained economic opportunities. New Zealand has some of the world's highest quality fresh water, ranking in the top ten for both its abundance and its cleanliness (United Nations 2003). However, variability in the occurrence of water means that although New Zealand has abundant freshwater, we often have shortages because that water is in the

wrong place and at the wrong time. In addition, the relationship between water use and water quality may mean that while there is an overall abundance of water, high demand for quality waters may result in scarcity for certain uses. However, users are increasingly looking for options that improve access to waters of the right quality and quantity. One such option is the transfer of waters from one location to another or from one catchment to another. Issues can arise when, for instance, commercial uses and recreational, environmental or aesthetic uses are in competition for the same water, or have conflicting views on water transfers.



**Figure 1:** Benmore Dam – Many rock art sites found in the Benmore Gorge where drowned below Lake Benmore.



**Figure 2:** Urban development has also resulted in the destruction of many sites of significance to Maori.



**Figure 3:** Irrigation – Many waterways are suffering from what whanau believe is an overallocation of water for extractive uses.

Māori have, for generations, voiced their concerns at the continual modification and manipulation of the waterways within their tribal territories (Waitangi Tribunal 1984, 1991, 1992, 1995, 1998). Most whānau, hapū and iwi are able to point to their experiences that show that almost all their experiences with water developments have been negative. For example:

- Wāhi tapu and wāhi taonga areas have been lost with a consequent loss of active associations and cultural relationships with the area.
- Previously valuable kai gathering areas have been destroyed, and in instances access to existing resources has also been adversely affected.
- Fish movement within river systems has been disrupted; both of juveniles into the system and of mature adults attempting to leave the system.
- Newly created lake, canal and wetland systems are typically adopted enthusiastically by a range of users who then develop these areas as recreational fisheries and boating areas. This results in further diminution of cultural interests and the erosion of rights in these areas.



**Figure 4:** Salmon Anglers in the Waitaki - there are many stakeholders with interests in the Waitaki that may compete with and impact the rights and interests of Ngai Tahu.

- Within existing water allocation regimes New Zealand, tangata whenua property interests in the ownership, management, usage and access to water resource never receives recognition let alone priority attention and has been subordinated to agricultural economic interests.
- The character of highly valued areas is irrevocably altered.
- Flow regimes are not adequate for the maintenance of a water body's mauri.
- Infrastructure construction has had serious environmental implications and can damage fishery and other cultural interests, sometimes irrevocably, and has interrupted the continuity of flow from the source to the sea which conflicts with holistic conceptualisations.
- Infrastructure such as dams trap sediment and coarser materials needed to replenish the eroding coastal environment.

In a New Zealand context, Māori and non-Māori both suffer the adverse effects of inappropriate and ineffective water management. Māori cannot divorce themselves from this challenge as their culture and ways of life are closely tied to the lands and waters within their rohe (tribal territories). The modifications to rivers and streams in New Zealand over the last hundred years have shown that the waters of many catchments can also be managed primarily as an economic resource that can be dammed, stored, diverted and extracted. This may conflict with Māori cultural values of those same waters. The transfer of water and the potential for cross mixing is one such issue.

In the last two decades Māori have become more vocal in seeking greater recognition of their cultural beliefs, values, and practices. If the needs of Māori are to be seriously considered and weighed alongside the needs of other populations, increased understanding of the issues and new assessment techniques are needed. This report explores some of the issues associated with cross mixing of waters before recommending ways in which councils could effectively incorporate the knowledge held within whānau, hapū and iwi into their decision-making.

## 1.2 Project aims

The purpose of this discussion document is to aid Manawhenua in their decision making for proposals that involve the transfer of water and the cross mixing of waters.

## 1.3 Report structure

There are four parts to the report:

- Part 1 introduces the report.
- Part 2 introduces a framework that could be used to assist Manawhenua to assess proposals involving the transfer of water resulting in cross mixing, and to illustrate for agencies and applicants some of the potential concerns from the perspective of Manawhenua.
- Part 3 discusses applying the framework.
- Part 4 concludes the report.





## 2.0

# FACTORS TO CONSIDER

### 2.1 Fundamental objectives of Manawhenua

Before whanau can assess the impact of a proposal to transfer water, they need to know what their vision and their objectives are for both the source and receiving catchments. Whanau need to be assured that their future aspirations will not be undermined by any proposal to transfer water.

### 2.2 Impacts of Transfers of Water

Potential impacts to a source catchment (from which water is taken) because of transfer of water that results in a reduced stream flow may include changes to:

- natural flow regime;
- water quality and the ability of the source water body to assimilate pollutants;

- habitat for native aquatic communities of fish and wildlife, including threatened and endangered species;
- wetlands and riparian habitat;
- availability of water-based recreational activities; and
- aesthetic qualities.

The potential impacts to a receiving catchment because of receiving water are similar, however the effects result from having an increased stream flow may include changes to:

- natural flow regime;
- water quality and the ability of the source water body to assimilate pollutants;
- habitat for native aquatic communities of fish and wildlife, including threatened and endangered species;
- wetlands and riparian habitat;
- availability of water-based recreational activities; and
- aesthetic qualities.



## 2.3 Decision making of whanau

There are at least six criteria that are likely to influence the decisions of Manawhenua.

1. Whether the cross mixing is to occur within a single catchment or it involves a transfer between different catchments.
2. Either the source or receiving catchments could sustain cultural values and uses that prohibit any cross mixing of the waters.
3. The receiving catchment must face water scarcity that cannot be avoided by other reasonable measures.
4. Water resources of the source catchment and the uses they sustain must be protected and not adversely impacted because of any transfer of water.
5. Substantial environmental damage should not occur in either the source of receiving catchments.
6. The benefits of the transfer should be equitably shared between the source and receiving catchments.

It is acknowledged that whanau, hapu and iwi around the country are likely to amend or add to the criteria listed above.

**Stage 1** Whether the cross mixing is to occur within a single catchment or it involves a transfer between different catchments.

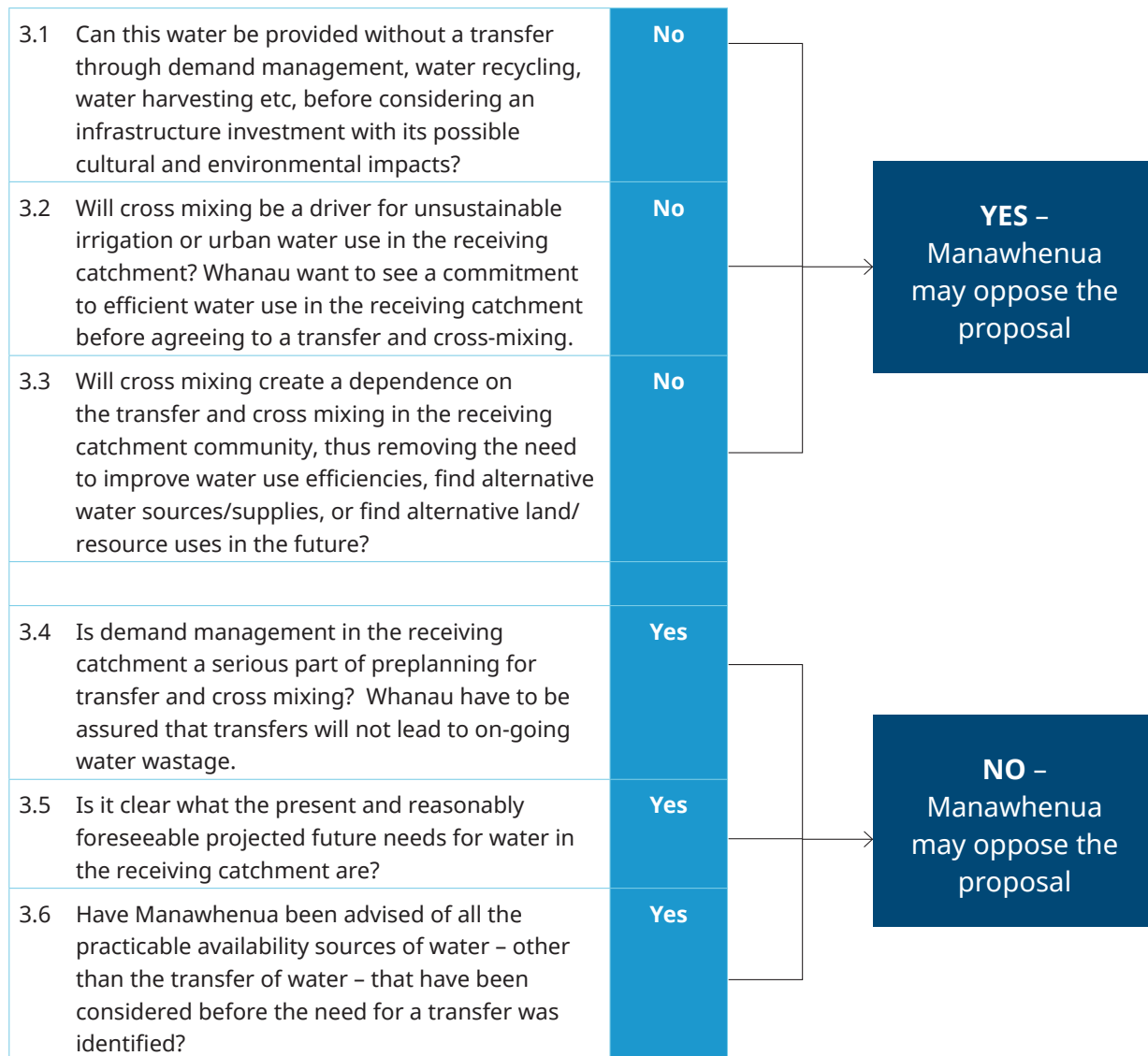
1.1	Is this proposal for the transfer of waters within the same catchment?	Yes	→	<b>NO –</b> Manawhenua may oppose the proposal
1.2	Will this transfer mix streams of similar types (e.g. a transfer of water from a lowland spring fed stream to another lowland spring fed stream)?	Yes		
1.3	Will this transfer mitigate an environmental issue of concern to Manawhenua?	Yes		
1.4	Will this transfer between surface water in one catchment and groundwater in the same catchment mitigate an environmental issue of concern to Manawhenua?	Yes		
1.5	Does this proposal involve mixing waters from different catchments that are underlain by a common aquifer?	Yes		

**Stage 2** Whether the source or receiving catchments could sustain cultural values and uses that prohibit any cross mixing of the waters.

2.1	Will the transfer and cross mixing involve the mixing of waters from two different sources?	No	→	<b>YES –</b> Manawhenua may oppose the proposal
2.2	Will the transfer and cross mixing impact the functioning of either the source or receiving catchments?	No		
2.3	Will the transfer and cross mixing involve the mixing of waters from waters of different traditional classifications?	No		
2.4	Will the transfer and cross mixing involve the mixing of waters valued for sustaining distinct cultural uses?	No		
2.5	Will the transfer and cross mixing involve the mixing of waters from either the source of receiving waters with wastes?	No		
2.6	Will the transfer and cross mixing involve the mixing of waters that adversely impact cultural conceptualisations?	No		
2.7	Will the transfer and cross mixing involve the mixing of waters that are valued for their distinctive water properties?	No		
2.8	Will the transfer and cross mixing result in positive cultural outcomes?	Yes	→	<b>NO –</b> Manawhenua may oppose the proposal

**Stage 3** The receiving catchment must face water scarcity that cannot be avoided by other reasonable measures.

Before progressing to commission any transfer and cross mixing, there should be a comprehensive assessment of the alternatives available for providing the water needed in the proposed receiving catchment.





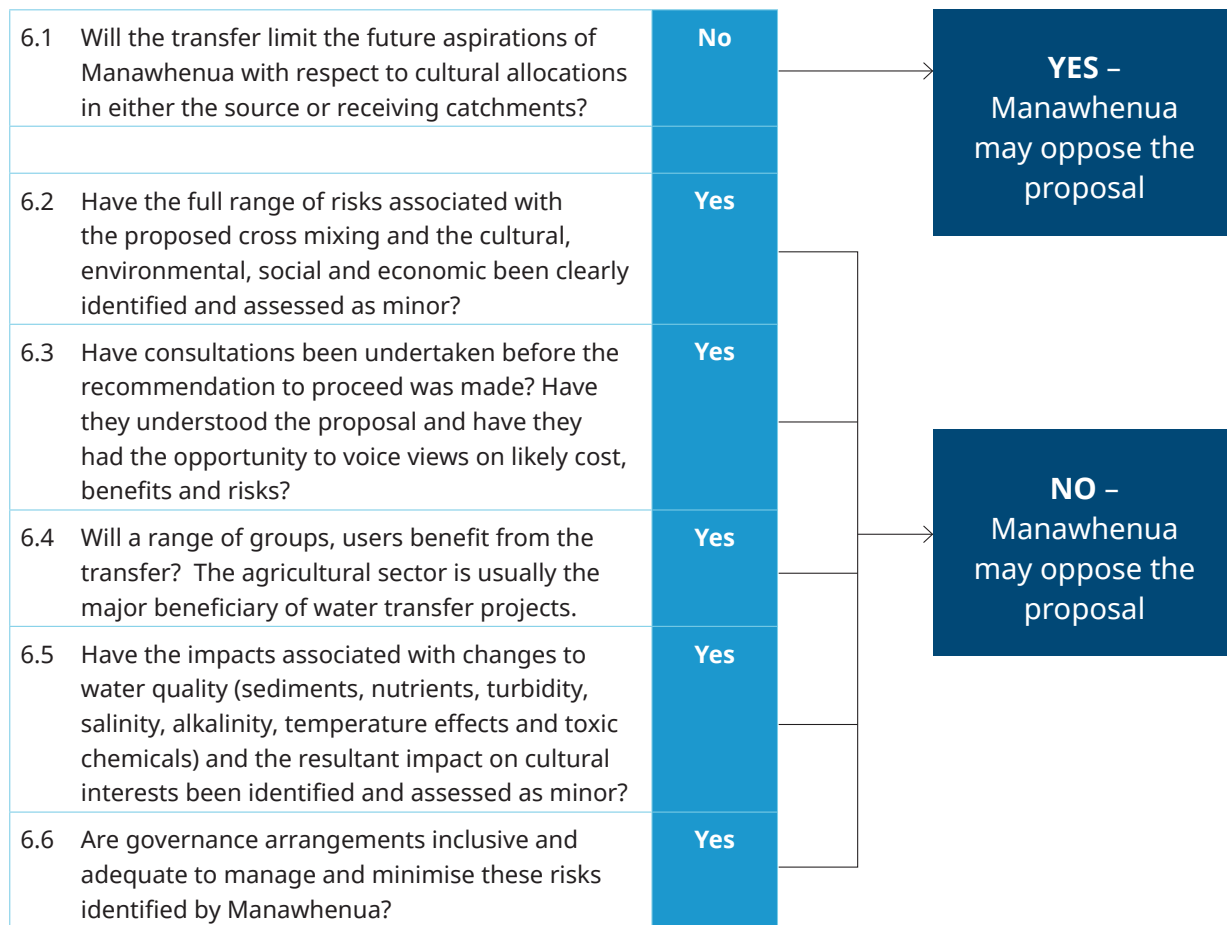
**Stage 4** Water resources of the source catchment & the uses they sustain must be protected.

4.1	Will the transfer of water see economic benefits in the receiving catchment at the cost of communities in the source catchment?	No		→	YES – Manawhenua may oppose the proposal
4.2	Are there benefits presently and prospectively derived from the flow of water within the source catchment of origin that would be impacted by a proposed transfer of water? Any proposed transfer should not unduly limit the future growth and development in the source catchment.	No			
4.3	Does the proposal interfere with planned uses or developments within the source catchment that are already consented, but not active, or for which an application is pending?	No			
4.4	Will the proposed transfer adversely affect the quantity or quality of water available for domestic, cultural, environmental, agricultural, industrial, public recreational, or municipal uses in the source catchment?	No			
4.5	Can the source of the water reliably sustain the transfer considering the predicted effects of climate change on precipitation patterns and temperature in the source catchment.	Yes		→	NO – Manawhenua may oppose the proposal
4.6	Can assurances be given to Manawhenua that sufficient quantities of water in the source catchment are available for future uses in the source catchment? This needs to take account of present and reasonably foreseeable projected future needs for water in the source catchment, including aspirations of Manawhenua for cultural allocations.	Yes			

**Stage 5** Significant environmental damage should not occur in either the source of receiving catchments.

5.1	Will the transfer and cross mixing create or escalate threats to taonga species?	No	→	<b>YES –</b> Manawhenua may oppose the proposal
5.2	Will the proposed transfer adversely affect the quantity or quality of water available for domestic, or town supplies within either the catchment source or the receiving catchment?	No		
5.3	Have the full range of risks associated with the proposed transfer and cross mixing and the cultural, environmental, social and economic impact been clearly identified?	Yes	→	<b>NO –</b> Manawhenua may oppose the proposal
5.4	Have consultations been undertaken before the recommendation to proceed was made? Have Manawhenua and communities understood the proposal and have they had the opportunity to voice views on likely cost, benefits and risks?	Yes		
5.5	Will a range of groups, users benefit from the transfer? The agricultural sector is usually the major beneficiary of water transfer projects.	Yes		
5.6	Have the impacts associated with changes to water quantity (level, discharge, velocity, groundwater and losses) and the resultant impact on cultural interests been assessed as minor?	Yes		
5.7	Have the impacts associated with changes to water quality (sediments, nutrients, turbidity, salinity, alkalinity, temperature effects and toxic chemicals) and the resultant impact on cultural interests been assessed as minor?	Yes		
5.8	Have other feasible alternatives to water transfers been investigated, including improved integration of surface and groundwater supplies and changing landuses patterns?	Yes		
5.9	Have the impacts on the whenua (erosion, sedimentation, salinity, alkalinity, waterlogging, changes in land use patterns, changes in mineral and nutrient contents of soils, earthquake inducement and any other hydrogeological factors) and the resultant impact on cultural interests been assessed as minor?	Yes		
5.10	Have the impacts on the atmosphere (temperature, evapotranspiration, changes in microclimate and macroclimate) and the resultant impact on cultural interests assessed as minor?	Yes		
5.11	Will the proposed transfer have any beneficial impact on navigation, hydropower generation, fish and wildlife habitat, aesthetics and recreation?	Yes		
5.12	Will the proposed transfer have any beneficial impact on aquatic factors (benthos, zooplankton, phytoplankton, fish, aquatic invertebrates, plants)?	Yes		
5.13	Will the proposed transfer will have any beneficial impact on land-based factors: indigenous vegetation, habitat enhancement?	Yes		
5.14	Will Manawhenua have the opportunity to peer review all the reports commissioned as part of the AEE?	Yes		

**Stage 6** The benefits of the transfer should be equitably shared between the source of receiving catchments.









## 3.0

# APPLYING THE MATRIX

There are three stages to applying the matrix. We recommend that Manawhenua start by identifying any of the questions in sections 2.3 that are must receive a positive response. For example,

- Manawhenua may decide that their fundamental objective is to protect taonga species. Therefore criteria 5.1 is “non-negotiable”. Any adverse impact on taonga species will result in the proposal not being supported.
- There is a risk that the proposal could result in the transferred waters mixing with waters that are classed and managed by Manawhenua as wai tapu. Therefore criteria 2.6 is a bottom line.

It is essential that bottom lines are identified before any assessment of the proposal.

The next stage is to work through each of the criteria listed in section 2.3. This list of questions will help identify gaps in the information provided, which Manawhenua can ask the proposers of the transfer to address.

Once all the questions in section 2.3 are answered it is for Manawhenua to weigh up the number of positive responses and those that are likely to result in adverse effects. There is the option to apply weightings to any of the criteria. Appendix 1 provides an example of how weightings could be used.

Ultimately the decisions as to whether a proposal for the transfer of water is acceptable to Manawhenua rests with Manawhenua. This framework has been produced to help whanau with their decisions.

## 4.0

# SUMMARY

What stands out among the cross-mixing experiences of whanau and hapu, is an observation that apart from hydropower generation, a common driver of transfers and cross mixings is a desire to promote agricultural production in water short areas, in particular the promotion of irrigated agriculture. Whanau are concerned that the agricultural sector may use transfers and not address issues of inefficient uses of water.

Most historic irrigation systems were inefficient in their water usage, and although the situation has improved markedly in recent years there is still a need to transition to newer and more efficient technology. Unfortunately, instead of attempting to make irrigation systems more efficient and then maintaining them at such levels, new sources of water for irrigation may be investigated. This is seen by some whanau as unsustainable when perhaps alternative landuses are wiser. There may also be a failure to examine alternatives to transfers and cross mixing.

To prevent these problems from occurring, it is necessary to thoroughly assess the potential impacts of any proposed scheme that transfers water from one waterway to another – be in in-catchment or between different catchments.

Ultimately it is the decision of whanau, hapu and iwi to determine the impact of any transfer on their cultural rights and interests (past, present and future), the scale of impact and its significance.



# APPENDIX

We suggest weightings be awarded on a 1-5 scale

- 1 means the criteria is of least importance.
- 5 means the criteria is one of the most important.

We suggest that Manawhenua decide if they want to use a scoring system when they answer each of the questions. If so, we suggest

- 1 for a negative response
- +1 for a positive response

In the tables that follow we provide an example of how the criteria could be weighted and scored. The tables are illustrative and do not apply to any existing example of water transfers.

**Stage 1** Whether the cross mixing is to occur within a single catchment or it involves a transfer between different catchments.

CRITERIA	WEIGHTINGS	RESPONSE	RESPONSE	SCORE
1.1 Is this proposal for the transfer of waters within the same catchment?	5	Yes	No	-5
1.2 Will this transfer mix streams of similar types (e.g. a transfer of water from a lowland spring fed stream to another lowland spring fed stream)?	1	Yes	No	-1
1.3 Will this transfer mitigate an environmental issue of concern to Manawhenua?	5	Yes	No	+5
1.4 Will this transfer between surface water in one catchment and groundwater in the same catchment mitigate an environmental issue of concern to Manawhenua?	3	Yes	No	-3
1.5 Does this proposal involve mixing waters from different catchments that are underlain by a common aquifer?	1	Yes	No	+1
TOTAL SCORE FOR THIS CRITERIA = -3				

**Stage 2** Whether the source or receiving catchments could sustain cultural values and uses that prohibit any cross mixing of the waters.

CRITERIA	WEIGHTINGS	RESPONSE	RESPONSE	SCORE
2.1 Will the transfer and cross mixing involve the mixing of waters from two different sources?	2	No	Yes	-2
2.2 Will the transfer and cross mixing impact the functioning of either the source or receiving catchments?	3	No	Yes	-3
2.3 Will the transfer and cross mixing involve the mixing of waters from waters of different traditional classifications?	5	No	Yes	5
2.4 Will the transfer and cross mixing involve the mixing of waters valued for sustaining distinct cultural uses?	5	No	Yes	5
2.5 Will the transfer and cross mixing involve the mixing of waters from either the source or receiving waters with wastes?	5	No	Yes	-5
2.6 Will the transfer and cross mixing involve the mixing of waters that adversely impact cultural conceptualisations?	5	No	Yes	-5
2.7 Will the transfer and cross mixing involve the mixing of waters that are valued for their distinctive water properties?	5	No	Yes	-5
2.8 Will the transfer and cross mixing result in positive cultural outcomes?	5	Yes	No	5
TOTAL SCORE FOR THIS CRITERIA = -5				

At the end of this exercise the scores can be collated for each of the criteria.

CRITERIA	TOTAL SCORE
Whether the cross mixing is to occur within a single catchment or it involves a transfer between different catchments.	-3
Whether the source or receiving catchments could sustain cultural values and uses that prohibit any cross mixing of the waters.	-5
Whether the receiving catchment faces water scarcity that cannot be avoided by other reasonable measures.	
Whether water resources of the source catchment and the uses they sustain are protected and not adversely impacted because of any transfer of water.	
Whether or not substantial environmental damage will occur in either the source or receiving catchments.	
Whether the benefits of the transfer are equitably shared between the source or receiving catchments.	

To reiterate, it is the decision of whanau, hapu and iwi to determine the impact of any transfer on their cultural rights and interests (past, present and future), the scale of impact and its significance. They may choose to weightings and scorings but that too is a decision of Manawhenua. This framework is suggested as a tool to focus discussions and aid decision making.



# SOURCE OF INFORMATION

Members of the North Canterbury Manawhenua  
Rural Lands Working Group.

Members of Te Runanga o Arowhenua Mataitai  
Committee

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