



A Cultural Flow Preference Study to enable whanau inform setting a flow regime

**Mandy Home
Gail Tipa**

(As part of NIWA's Water Allocation Programme)

Overview of presentation

- Describe the six step process
- Explain the fieldwork needed
- Explain the analyses completed
- Give examples of studies completed

So far

- We have preference studies underway
 - Across Canterbury
 - In East Otago
 - In North Otago
- We are working with Ngai Tahu whanau groups
- We are keen to trial the method with other hapu / iwi

A Cultural Flow Preference Study

- Map sites, values, opportunities sought
- Document whanau understandings of hydrological system and changes over time
- Undertake fieldwork to assess each site
- Assess sites under different flows
- Analysis to tease out fundamental flow needs
- Work with scientists to explore site specific issues

Fieldwork

- Data gathered from regular assessments of set sites over a 12 month time period
- Nineteen attributes
- Rate significance of attribute
- Rate satisfaction with flow
- Rate size of flow



Arowhenua experiences with process

Designing a process

- We didn't assume that there was a flow assessment method that we could teach whanau to apply
- Our starting point was what whanau told us about their relationship with rivers
- We wanted to whanau to participate as themselves (i.e. be inclusive and safe)
- We found a theoretical perspective that was consistent with what our whanau said and did

A preference based assessment

So how valid is a preference approach?

- For decades landscape assessments have quantified and measured attributes of landscapes
- With integrated perception studies since the 1980s
 - Both quantitative and qualitative approaches
 - Linking subjective and objective

Prefer environments that **afford** opportunities, **make sense**, are **familiar**, invite **involvement**, or crucial to **identity**

Themes

- The nineteen attributes are grouped into 4 themes
 - Wai Maori
 - Cultural use / mahinga kai
 - Cultural landscape
 - Health and wellbeing
- Number of sites in a catchment varies (2 – 30) – a mix of mainstem and tributaries

Analyses to inform decisions

At each site assessed we can

- Identify the flows at which all 4 themes are scored as unsatisfactory.
- Identify the flows at which all 4 themes are scored as satisfactory.
- Identify the flows at which at least one theme is of concern.
- Examine the attribute scores to understand reasons for concern / dissatisfaction
- In the band of satisfaction, tease out flow issues e.g. duration of flow

We can use the data to link to others undertaking flow assessments

Site result – for one day

- We get a number of matrices for each site for each day visited – scores for 19 attributes grouped into 4 themes

Wai	Use	H&W	Landscape
2.38	3.11	2.13	3.17

We can match the scores to the flow on this day

Site result – see scores for all 19 attributes over multiple visits

	Visit 1	Visit 2	Visit 3	Visit 4
Flow enables use of the site as a mahinga kai	Red	Yellow	Yellow	Green
Flow keeps the riverbank vegetation watered	Red	Yellow	Green	Yellow
Flow keeps the river free of weed / algae	Red	Red	Yellow	Yellow
Flow provides a range of habitats instream and along riverbank	Red	Yellow	Yellow	Yellow
Flow protects mahinga kai species in and around this site	Red	Yellow	Yellow	Green
Flow enables fish to move throughout the catchment	Red	Yellow	Green	Green
Flow enables gathering at this site (i.e. is accessible, safe)	Red	Yellow	Green	Green
Flow keeps this site free of unnatural gravel buildups	Red	Red	Yellow	Yellow
Flow keeps riparian wetlands, springs, and/or tributaries connected to mainstem	Red	Yellow	Yellow	Yellow

Examine individual attributes over a year

Flow enables
development and
use of Maori
lands / reserves
& easements

SITE 1
Dissatisfied on
quarter of visits
(summer flows)

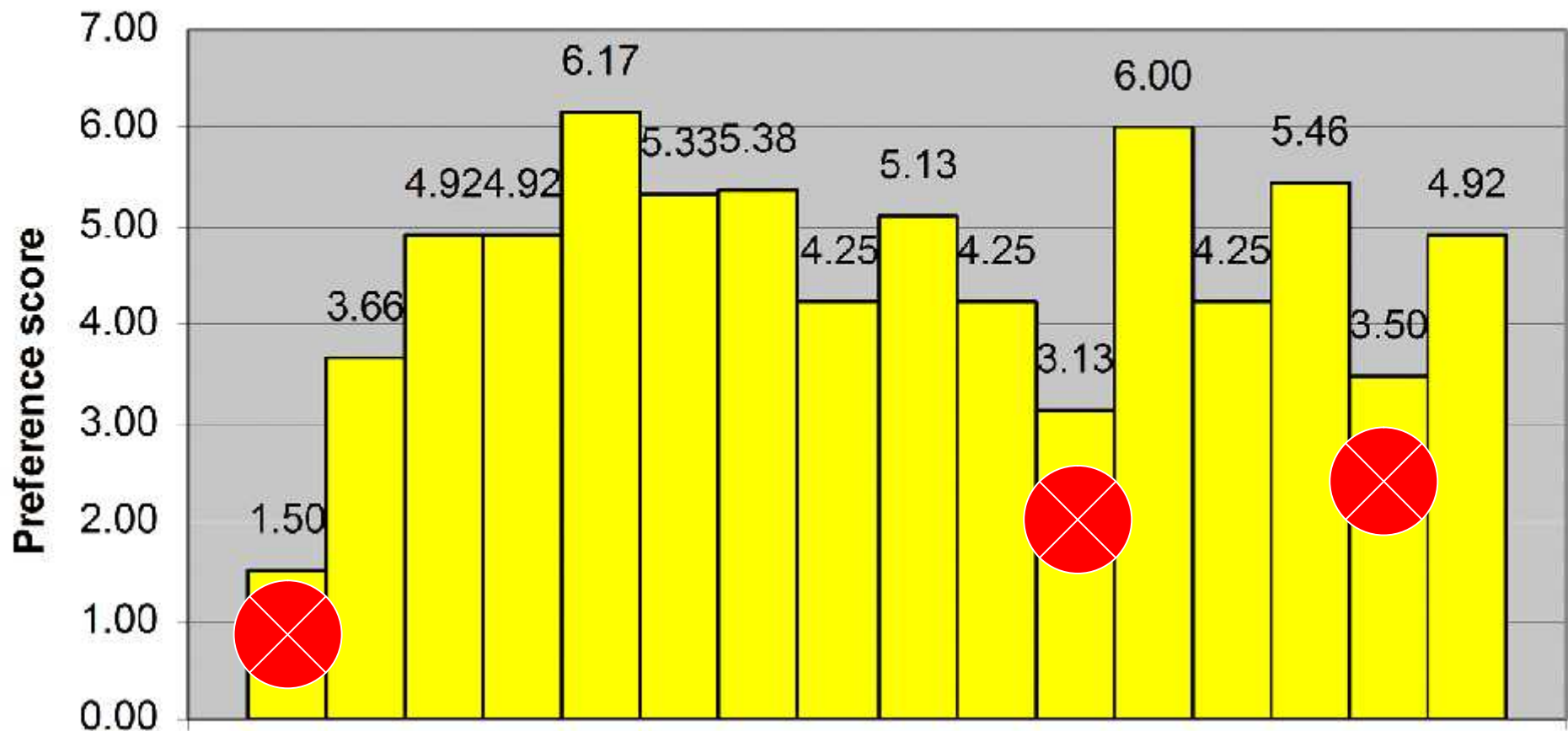
SITE 2
Always satisfied

SITE 3
Always very satisfied

- Tangata whenua were given fishing easements in 1868
- This is an inalienable right.
- Flow at this site needs to provide water of sufficient quality and quantity to enable fishing.

Examine preference scores for one theme at each site over a year

Preference score vs Wai Maori



And in a different case – all themes over a year

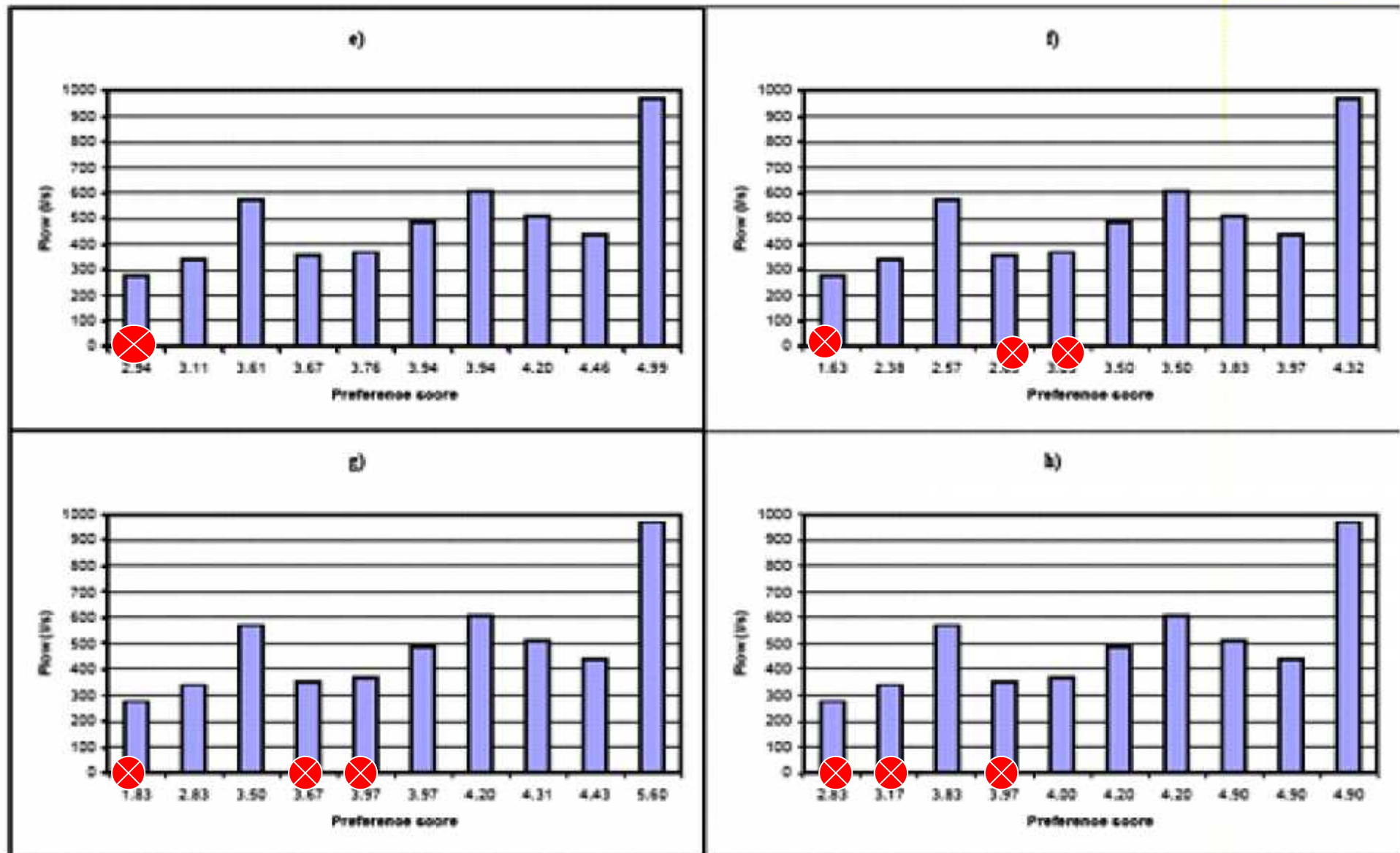
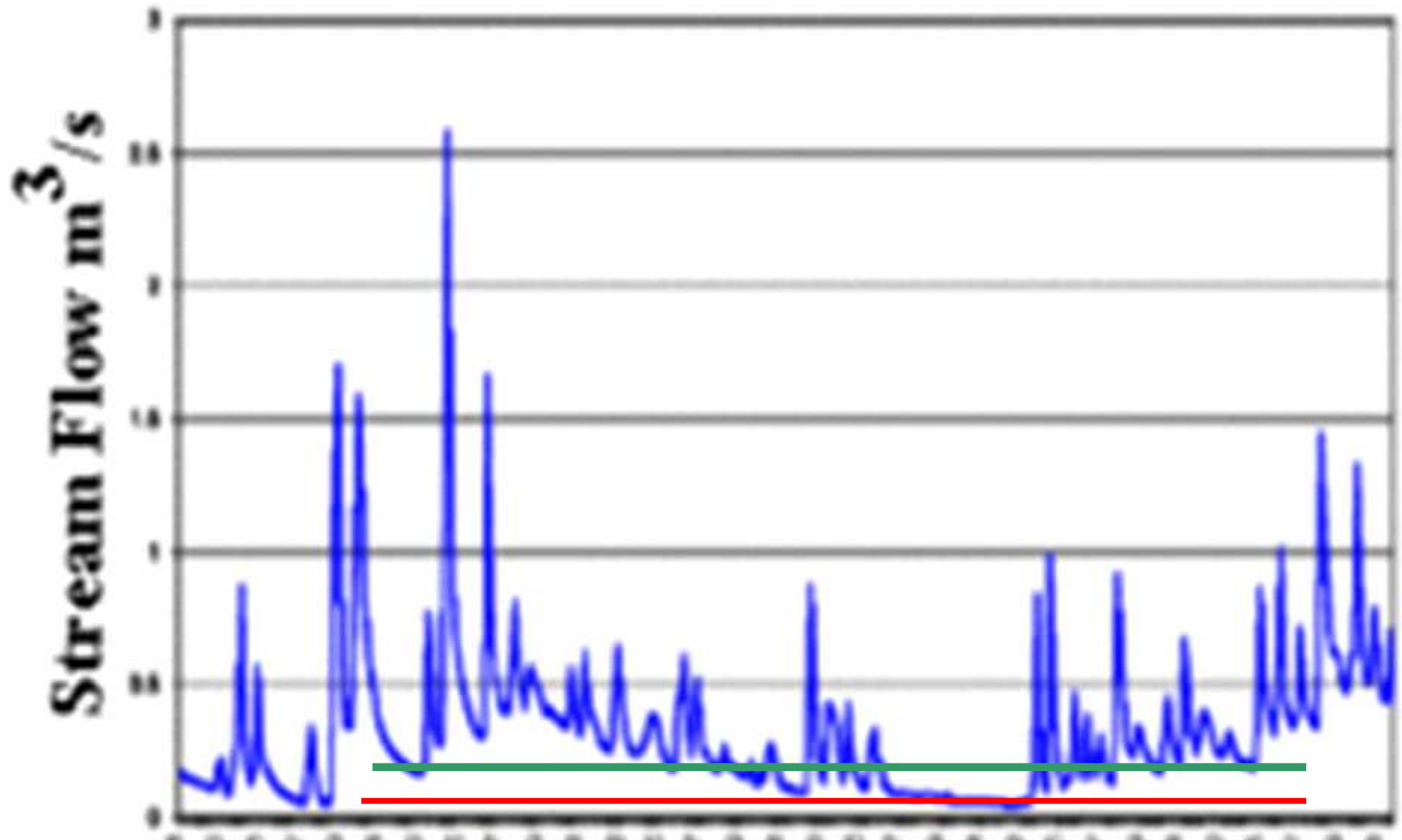
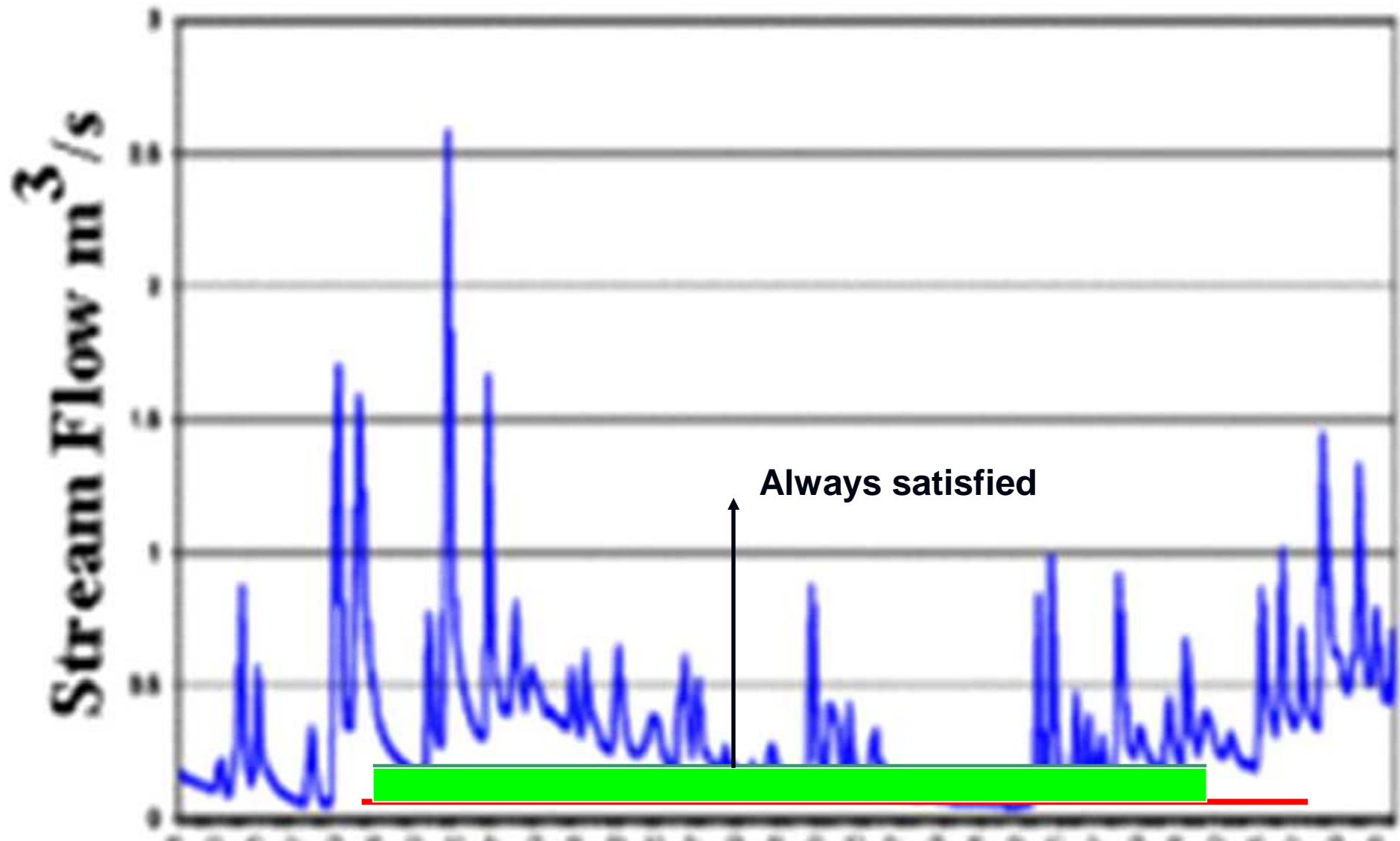


Figure 4: Preference Scores for a) Mahinga kai, b) Wai maori, c)Hauora and d) Landscape for flow below 1000 l/s in the Kakaunui River at Mill Dam

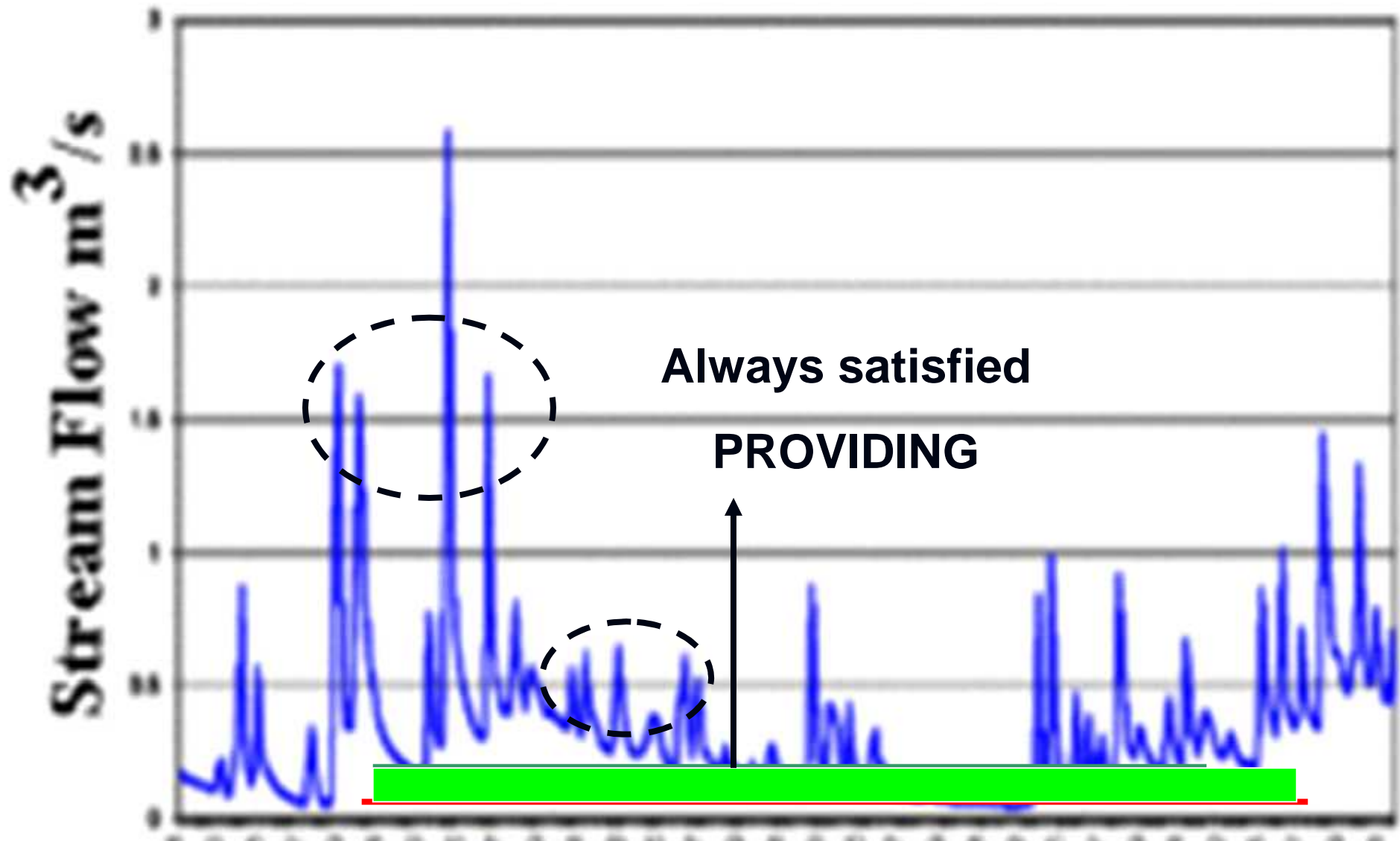
Identify flows (date & time)



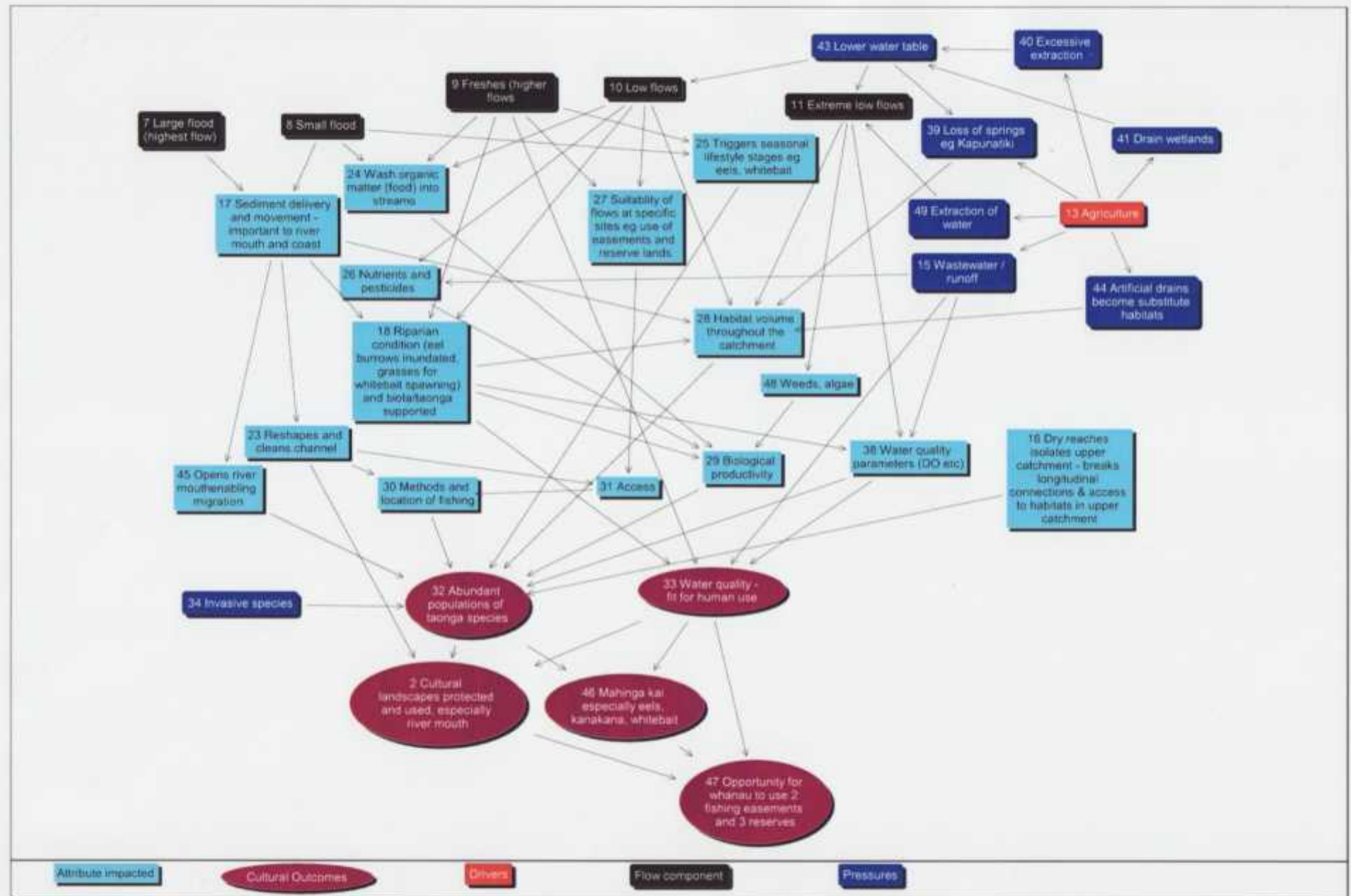
Identifying flow issues



Identify flow regime components



We know how whanau see the world



Linking with other sources of information

Orari:

For one site near the reserve, we know that

- Gravel, weed, connectivity are issues at low flows.
- We know sites where flows are a crucial issue e.g. use of Maori lands, reserves and easements.

We can compare results to other flow assessments

Orari River:

- Regional Council proposed three options (l/s)
 - 384 minimum with flows at 900 and 1800 for some months
 - 384 minimum with flows at 1800 for some months
 - 900 minimum with flows 1800 for some months
- Cultural Flow Preference 900 minimum with flow variability included above that minimum

Kakanui River:

- Scientists, DOC, Cultural Flow Preference are all around the 350 – 400 l/s
- Council proposed 250 l/s
- Runanga does not accept 250 l/s

Significant attributes for the Orari

1. Flow enables development and use of **Maori lands / reserves / easements**
2. Flow to enable **cultural use** of connected wetlands, springs & tributaries
3. Flow to provide a **range of habitats** instream and along riverbank
4. Flow enables whanau to be proud of this site
5. Flow maintains links between this site and other culturally significant sites

Your significant attributes may be different.

Questions