

ARROW CATCHMENT AND WAKATIPU BASIN AQUIFERS

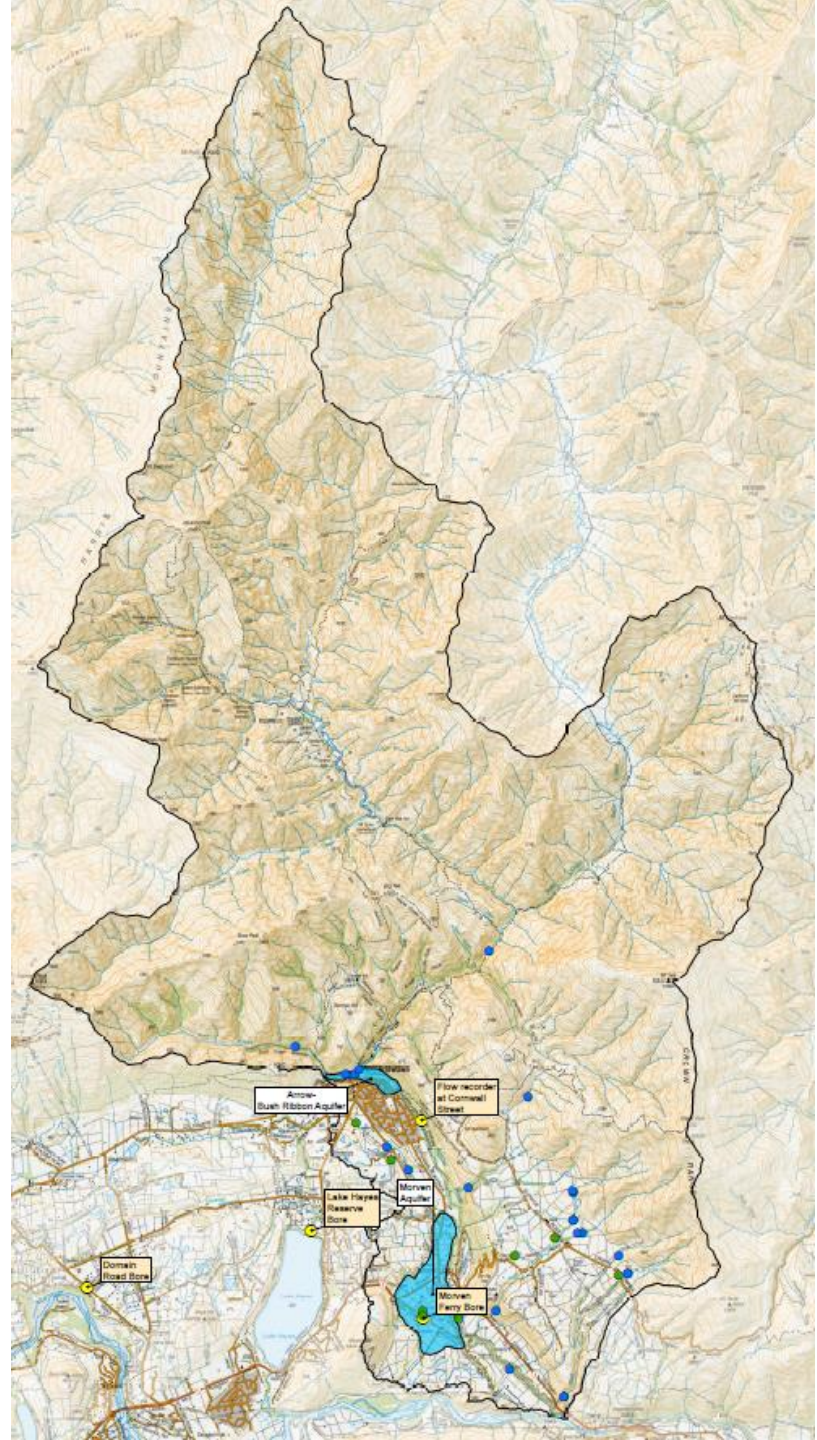
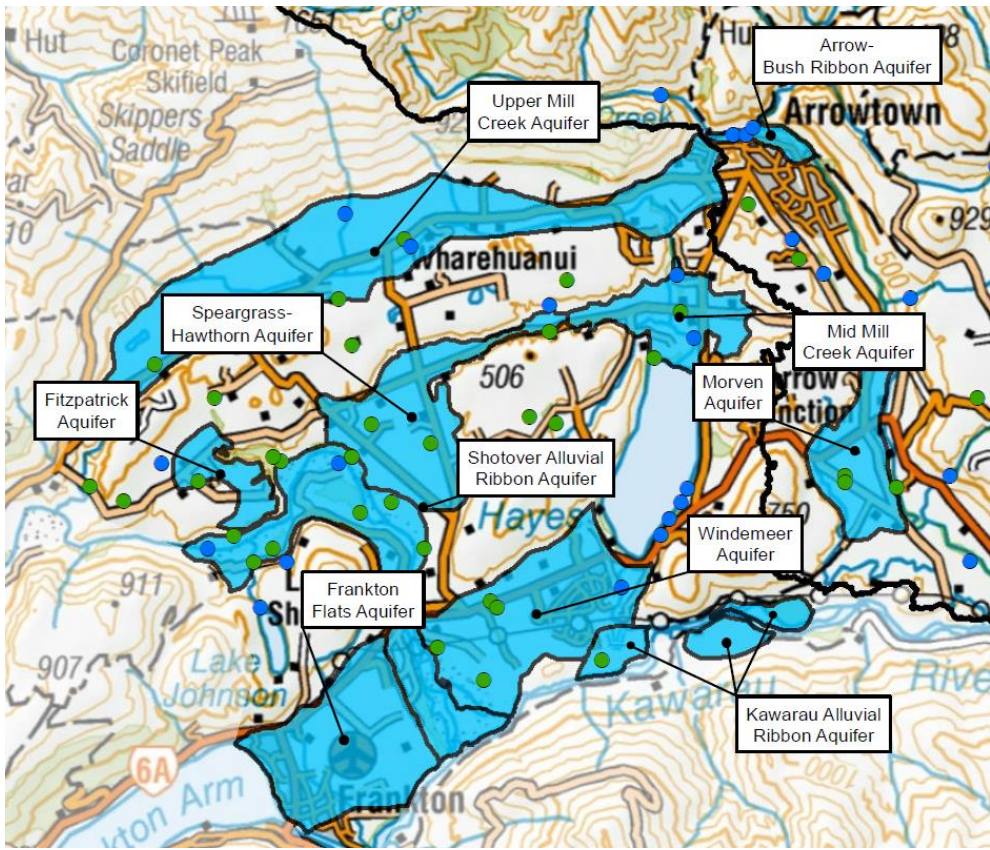
Developing a plan change



About

- Overview
- What we heard last time
- Background
- The options
- Upcoming consultation
- Where to next

Arrow catchment and Wakatipu Basin aquifers



Community values



- Most common:
 - Recreation use (including fishing, swimming, walking, cycling)
 - Physical and visual character
 - Water supply for community and irrigation use
- Other points
 - Environmental bottom line as a starting point
 - Low flows could impact negatively on recreation values

The process

1. Consultation on values
2. Reports on surface water, instream habitat and groundwater
3. Identify options for the plan change
4. Identify social and economic effects of options
- 5. Consultation on options**
6. Identify preferred option and draft the plan change
7. Consultation on the draft plan change
8. Notify the plan change and seek submissions
9. Hearing
10. Commissioner deliberations
11. Plan change decision
12. Resolve any appeals

Options Consultation

- Options development, has considered:
 - Values consultation
 - Scientific and environmental analysis
 - Cultural values assessment
- Economic and social analysis on options
- Seeking feedback on a preferred option

The Arrow Catchment – Surface Water



The Arrow catchment

- Flow statistics:
 - Flowing river that does not dry naturally.
 - Flows are highest from May to Nov and lowest Jan to April.
 - Naturalised 7-day Mean Annual Low Flow (MALF) is 1.43-1.44 m³/s)



The Arrow catchment

Water takes:

Number of consented takes	Number of deemed permits	Consented allocation	Actual Takes
22	14	2.03m ³ /s	0.596 m ³ /s



The Arrow catchment

Habitat modelling for the following values was undertaken:

- Native fish – single record of Koaro.
- Trout
 - both brown and rainbow trout
 - locally significant sports-fish habitat.
- Periphyton
- Food production (invertebrates)



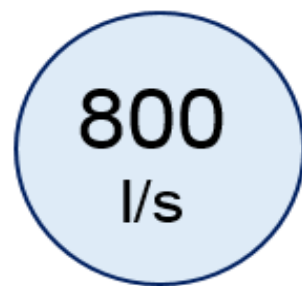
Flow requirements to maintain instream values

Instream Value	Season	Recomm. % of habitat retention	Flow to maintain suggested habitat retention (l/s)	Flow below which habitat rapidly declines (l/s)	Optimum flow (l/s)
Adult trout	All year	70%	553	-	1,600
Juvenile trout	All year	70%	198	500	900
Brown trout – spawning	Winter	70%	44	400	600
Rainbow trout – spawning	All year	70%	127	400	600
Food producing	All year	70%	392	600	900
Avoid Long Filamentous algae	Summer	<150%	>755	800	-



Minimum Flow Options

Option 1



+

Sub option 1A

Supplementary minimum flow

1050 l/s

Allocation block

250 l/s

or

Sub option 1B

Supplementary minimum flow:

1200 l/s

Allocation block

500 l/s

Option 2



+

Sub option 2A

Supplementary minimum flow

1150 l/s

Allocation block

250 l/s

or

Sub option 2B

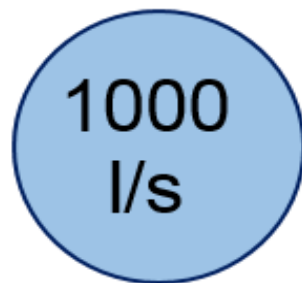
Supplementary minimum flow:

1200 l/s

Allocation block

500 l/s

Option 3



+

Sub option 3A

Supplementary minimum flow

1250 l/s

Allocation block

250 l/s

or

Sub option 3B

Supplementary minimum flow:

1200 l/s

Allocation block

500 l/s

Primary Allocation Options

Option 1

700
l/s

This Primary allocation limit would be set in Schedule 2A of the Water Plan.




Option 2

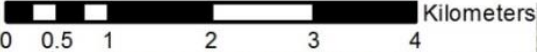
Status
Quo

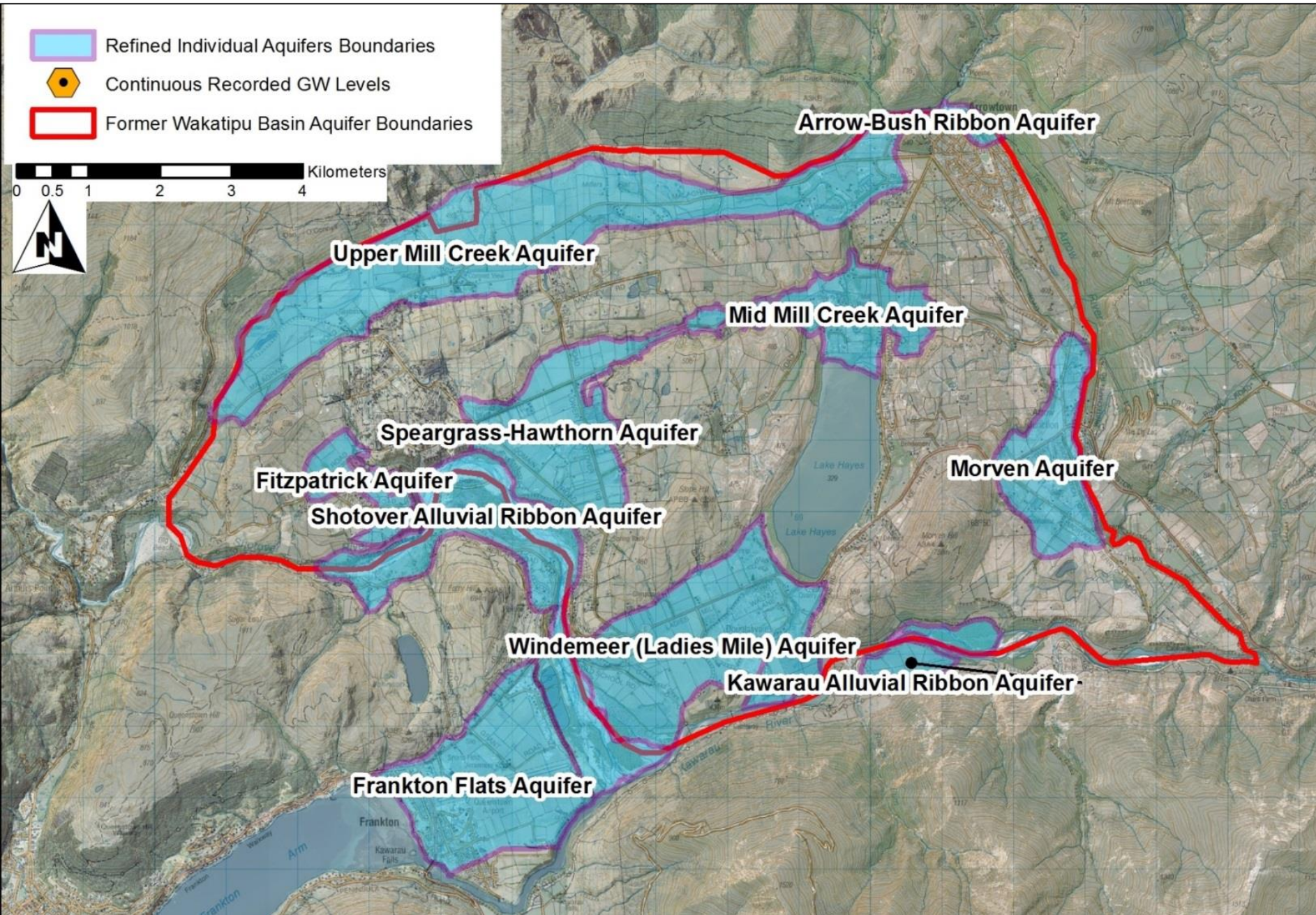
Existing Policy 6.4.2 - 50% of the 7 day Mean Annual Low Flow.

Currently this would result in an allocation of 720l/s.

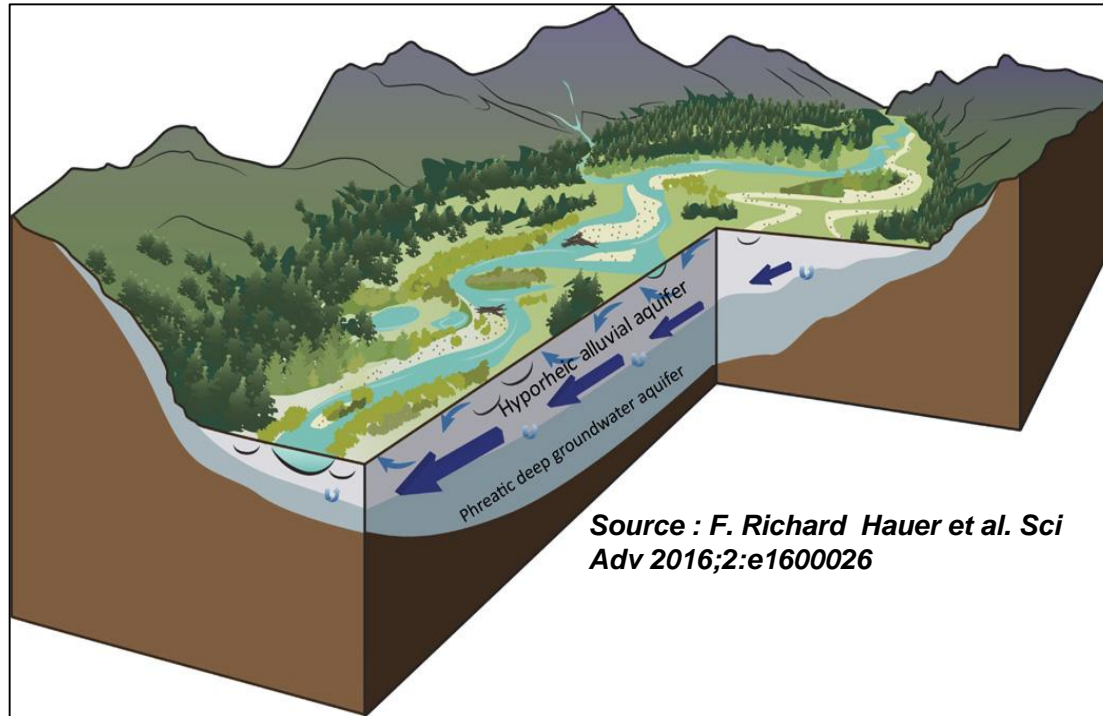
Wakatipu Basin Aquifers

-  Refined Individual Aquifers Boundaries
-  Continuous Recorded GW Levels
-  Former Wakatipu Basin Aquifer Boundaries

 Kilometers
0 0.5 1 2 3 4



Arrow Bush Ribbon, Kawarau & Shotover Alluvial Ribbon Aquifers



- Aquifers located in alluvium and interacting with the associated river.
- In the Water Plan groundwater takes allocated to the surface water body/connected river.

Wakatipu Basin aquifers – Surface water

- Arrow-Bush Ribbon aquifer
- Shotover Alluvial Ribbon aquifer
- Kawarau Alluvial Ribbon aquifer

Option 1

Treated
as
Surface
Water

All takes treated as surface water within associated catchment.

Note: Until minimum flow and allocation is set for the Shotover and the Kawarau Rivers, the status quo will apply.

or

Option 2

Status
quo

- Surface water if within 100 m of connected surface water, or
- Groundwater and surface water if >100 m from connected surface water and at least 5l/s stream depletion

Other Wakatipu Basin Aquifers

- Upper Mill Creek
- Mid Mill Creek
- Morven
- Windemeer / Ladies Mile
- Frankton Flats
- Speargrass – Hawthorn
- Fitzpatrick

These aquifers:

- Unconfined Aquifers located in river deposits and glacial outwash.
- Functioning independently.
- Two main recharge sources: rainfall and rivers / streams.

Allocation Limits

Aquifers	Water Volumes (Mm3)		
	Groundwater Maximum Allocation Value	Consented Groundwater Takes	Groundwater Available
Fitzpatrick Aquifer	0.105	0.058	0.047
Frankton Aquifer	0.210		0.210
Windemeer / Ladies Mile Aquifer	0.240	0.138	0.102
Mid Mill Creek Aquifer	0.510	0.016	0.494
Morven Aquifer	0.185	0.010	0.175
Speargrass-Hawthorn Aquifer	0.230	0.041	0.189
Upper Mill Creek Aquifer	0.785	0.022	0.763

Allocation limit Options

Option 1

- Schedule 4A aquifer.
- Sets the Maximum Allocation Limit in the Water Plan.

Option 2

- Status Quo:
- Maximum allocation limit is calculated as 50% of mean annual recharge.

**Morven
Aquifer**

0.185
Mm³/yr

Or

Status
quo

**Speargrass -
Hawthorn
Aquifer**

0.23
Mm³/yr

Or

Status
quo

**Upper Mill
Creek
Aquifer**

0.79
Mm³/yr

Or

Status
quo

**Mid-Mill
Creek
Aquifer**

0.51
Mm³/yr

Or

Status
quo

**Windemeer /
Ladies Mile
Aquifer**

0.24
Mm³/yr

Or

Status
quo

**Frankton
Flats Aquifer**

0.21
Mm³/yr

Or

Status
quo

**Fitzpatrick
Aquifer**

0.105
Mm³/yr

Or

Status
quo

Social and Economic Assessments

■ Social

- Two Focus groups
- Existing flows acceptable for landscape, scenic and recreation values.
- Support for the use of water for tourism and recreation.
- Reluctance to explore additional water takes.

■ Economic

- Considerable value attributed to amenity and tourism.
- Difficult to monetise the value water availability.

Format of Today's Session

- Opportunity for Q and A
- Discussion to learn more about the options and identify issues and concerns
- Opportunity to provide feedback on preferred option.



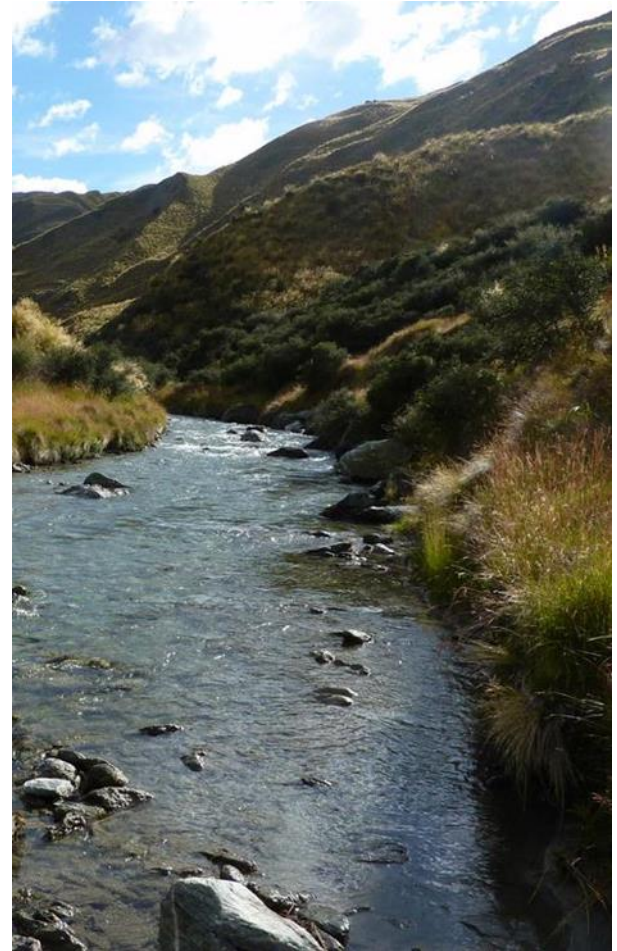
How can you provide feedback?

- Provide your feedback today
- Fill in a feedback form (email or post)
- Fill in an on-line feedback form
- Feedback is required by Friday 26 January 2017



Next steps

- Review and summarise feedback.
- Finalise our assessment of the options.
- Identify a preferred option.
- Prepare draft plan change.
- Community and stakeholder consultation in April 2018



Thank-you

