McKay Creek

Rapid Habitat Assessment

▶ Rapid Habitat Assessment

A Rapid Habitat Assessment (RHA) is used to provide a quick assessment of the stream habitat of a specific section/reach of the waterway. It provides a 'habitat quality score' for a river reach which indicates general stream habitat condition for the physical aspect, such as the structure of the stream banks or the nature of the stream bed.

Aquatic life is dependent on various features of stream habitat and riparian areas. Knowing what types of habitats are present, in what amounts and how these habitats might be changing over time is vital to understanding overall stream health. Using the RHA protocol to help track the impact of stream restoration efforts such as fencing and planting along waterways over time can help measure improvements.

An RHA can be carried out by experts, or community groups and individuals. The assessment is carried out against 10 variables scored from 1 to 10 with a total possible score of 100. The variables are shown on the left hand-side of the table on the following page 3.

This table shows the results for 2016-2021 of testing at the Aparima River at Thornbury Monitoring Site, which is the closest waterway to McKay Creek at Carmichael Road, and also where Environment Southland official State of the Environment monitoring is regularly completed.

Overall the results show some variation for that site with results in the good to poor range. Note that the results of the data will change from time to time depending on weather, recent events and the interpretation of the person undertaking the assessment. The trends over time paint the most reliable picture.

During the stream walk today we will work through each of the variables. You can help us score these using the field recording sheet at the back of this information brochure.

Stream Health Monitoring and Assessment Kit

NIWA's Stream Health Monitoring Assessment Kit (SHMAK) provides a scientifically-sound resource to monitor the ecological health of New Zealand's streams. First released in 1998, SHMAK was developed as a joint project between Federated Farmers and NIWA.

Stream health is the condition (or state) of the whole stream ecosystem, including water quality, physical features of the stream and its banks, and the plants and animals living there. It also includes aspects that affect human health, safety and enjoyment.

During the stream walk we will use parts of the SHMAK Kit including the clarity tube, macroinvertebrate ID (see Critter ID card), temperature and periphyton (algae).

More information

- Further information, including short videos can be found on the Environment Southland website – www.es.govt.nz/environment/education/backyard-activities.

- Go to the Cawthron website to find out how to carry out a Rapid Habitat Assessment – www.cawthron.org.nz/research/our-projects/rapid-habitat-assessment-protocol.

- Water quality andecological monitoring sites in the Aparima River Catchment go to www.lawa.org.nz/explore-data/southland-region/water-quantity/monitoring-sites/aparima-river-at-thornbury

- For real-time water level and rainfall data from Environment Southland's monitoring sites in the Aparima catchment, go to www.es.govt.nz/maps and data

Critter Identification Card

greater WELLINGTON
REGIONAL COUNCIL
Te Pane Matua Taiao

Mayflies		
8	9	9

Large Stoneflies		Small Stoneflies
10	10	5

Uncased Caddis	Cased Caddis	Purse Caddis
6	9 / 10	3

Dobsonfly	Beetles	Damselflies
7	6	5

Dragonflies	Amphipods	Snails
6	10	3

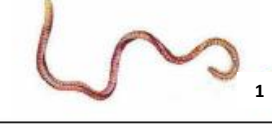| Water Boatmen	Worms	Flies
5	1	2 / 3

To calculate Macroinvertebrate Community Index

Add all scores of all invertebrates observed together.

Divide this by number of different invertebrates.

Multiply this number by 20.

Stream health assessment using MCI

Excellent	>120
Good	>100 to 120
Average	80 to 100
Poor	<80

▶ Macroinvertebrate Community Index (MCI) scores

The MCI uses the type and number of bugs in the water an as an indicator of stream health. Higher MCI scores indicate better stream conditions. The MCI samples gathered from the testing site at Thornbury on the Aparima River between 2004 and 2020 show that in recent years the river was in 'good to poor' health, with MCI scores in the range of 80 - 103.

For more detail about MCI see www.lawa.org.nz/learn/glossary/m/macroinvertebrate-community-index-mci

MCI samples for Aparima River at Thornbury
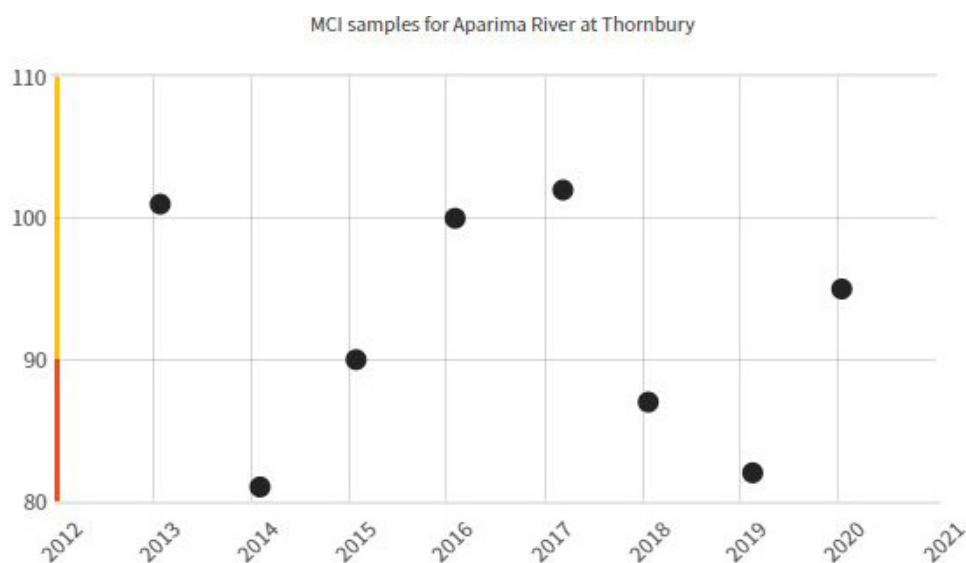
▶ Rapid Habitat Assessment Results – Aparima River at Thornbury, 2016-2021

VARIABLES	9/02/2016	27/03/2017	24/01/2018	14/02/2019	21/01/2020	1/03/2021
Deposited sediment	5	10	9	9	9	9
Invertebrate habitat diversity	7	6	6	9	6	9
Invertebrate habitat abundance	9	10	5	10	10	8
Fish cover diversity	7	4	5	5	5	7
Fish cover abundance	3	3	4	5	5	6
Hydraulic heterogeneity	9	7	9	8	9	7
Bank erosion	8	7	7	9	8	9
Bank vegetation	5	5	3	4	4	6
Riparian width	9	9	10	6	6	7
Riparian shade	2	1	2	2	2	2
Total score	**64**	**62**	**60**	**67**	**64**	**70**

▶ River Habitat Assessment – field recording sheet (Cawthron, 2020)

HABITAT PARAMETER	CONDITION										SCORE
Deposited sediment	*The percentage of the streambed covered by fine sediment.*										
	0	≤ 5	5	15	25	35	50	65	75	>75	
SCORE	10	9	8	7	6	5	4	3	2	1	
Invertebrate habitat diversity	*The number of different substrate types such as boulders, cobbles, gravel, sand, wood, leaves, root mats, macrophytes, periphyton. Presence of interstitial space score higher.*										
	≥5	5	5	4	4	3	3	2	2	1	
SCORE	10	9	8	7	6	5	4	3	2	1	
Invertebrate habitat abundance	*The percentage of substrate favourable for EPT colonisation such as flowing water over gravel-cobbles clear of filamentous algae/macrophytes.*										
	95	75	70	60	50	40	30	25	15	5	
SCORE	10	9	8	7	6	5	4	3	2	1	
Fish cover diversity	*The number of different substrate types such as woody debris, root mats, undercut banks, overhanging/encroaching vegetation, macrophytes, boulders cobbles. Presence of substrates providing spatial complexity score higher.*										
	≥5	5	5	4	4	3	3	2	2	1	
SCORE	10	9	8	7	6	5	4	3	2	1	
Fish cover abundance	*The percentage of fish cover available.*										
	95	75	60	50	40	30	20	10	5	0	
SCORE	10	9	8	7	6	5	4	3	2	1	
Hydraulic heterogeneity	*The number of hydraulic components such as pool, riffle, fast run, slow run, rapid, cascade/waterfall, turbulence, backwater. Presence of deep pools score higher.*										
	≥5	5	4	4	3	3	2	2	2	1	
SCORE	10	9	8	7	6	5	4	3	2	1	
Bank erosion	*The percentage of the streambank recently/actively eroding due to scouring at the waterline, slumping of the bank or stock pugging.*										
Left bank	0	≤ 5	5	15	25	35	50	65	75	>75	
Right bank	0	≤ 5	5	1525		35	50	65	75	>75	
SCORE	10	9	8	7	6	5	4	3	2	1	
Bank vegetation (left bank **and** right bank)	*The maturity, diversity and naturalness of bank vegetation.*										
	Mature native trees with diverse and intact understorey		Regenerating native or flaxes/sedges/tussock > dense exotic			Mature shrubs, sparse tree cover > young exotic, long grass			Heavily grazed or mown grass > bare impervious ground		
SCORE	10	9	8	7	6	5	4	3	2	1	
Riparian width	*The width (m) of the riparian buffer contrained by vegetation, fences or other structures*										
Left bank	≥30	15	10	7	5	4	3	2	1	>0	
Right bank	≥30	15	10	7	5	4	3	2	1	>0	
SCORE	10	9	8	7	6	5	4	3	2	1	
Riparian shade	*The percentage of shading of the streambed throughout the day due to vegetation, banks or other structures*										
	≥90	80	70	60	50	40	25	15	10	≤ 5	
SCORE	10	9	8	7	6	5	4	3	2	1	
TOTAL											