



Rapid Habitat Assessment

Otautau Stream at Waikouro

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 also shows the results for 2016-2021 testing at the Otautau Stream at the Waikouro Monitoring Site. Overall the results show a consistently moderately good score for this site. The data for this particular site

has been provided because it is the closest Environment Southland monitoring site to the stream walk site.

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 part of the SHMAK kit including the clarity tube, temperature, macroinvertebrates, 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.
- For water quality and ecological monitoring sites in the Otautau Stream go to <https://www.lawa.org.nz/explore-data/southland-region/river-quality/aparima-river/otautau-stream-at-waikouro/>
- For real-time water level and rainfall data from Environment Southland's monitoring sites in the Otautau Stream, go to www.es.govt.nz/maps-and-data.

Critter Identification Card



Mayflies  8	 9	 9
Large Stoneflies  10	 10	Small Stoneflies  5
Uncased Caddis  6	Cased Caddis  9	Purse Caddis  3
Dobsonfly  7	Beetles  6	Damselflies  5
Dragonflies  6	Amphipods  10	Snails  3
Water Boatmen  5	Worms  1	Flies  2 3

To calculate Macroinvertebrate Community Index

Add all scores of all invertebrates observed together.

Divide this by number of different invertebrates.

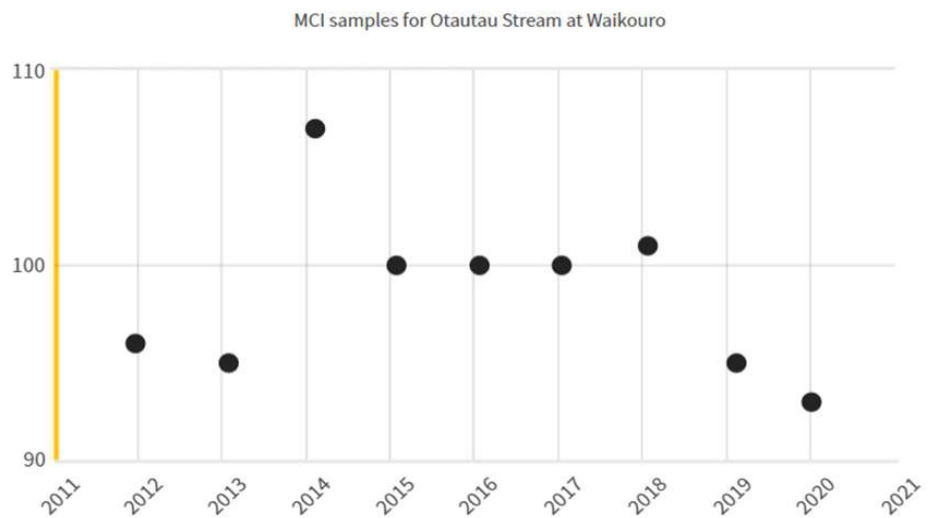
Multiply this number by 20.

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 as an indicator of stream health. Higher MCI scores indicate better stream conditions. The MCI samples gathered from the testing site at Waikouro on the Otautau Stream between 2016 and 2021 show that is recent years the river is in 'average' to 'good' health, with an MCI score varying between 93 and 107.



Rapid Habitat Assessment Results – Otautau Stream at Waikouro, 2016-2021

VARIABLES	25/01/2016	16/01/2017	25/01/2018	14/02/2019	6/01/2020	12/02/2021
Deposited sediment	5	4	2	7	7	7
Invertebrate habitat diversity	6	6	6	6	10	7
Invertebrate habitat abundance	4	6	5	7	8	4
Fish cover diversity	6	4	7	6	4	6
Fish cover abundance	4	4	8	4	5	4
Hydraulic heterogeneity	3	2	7	5	3	3
Bank erosion	6	8	10	7	4	7
Bank vegetation	4	4	3	4	4	4
Riparian width	8	5	6	5	4	6
Riparian shade	3	6	5	1	2	5
Total score	49	49	59	52	51	53

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	15	25	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 constrained 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													