Common freshwater macroinvertebrate species recorded at the Riverside monitoring site

Mayflies
The two mayfly species found so far are indicative of good habitat and water quality, particularly if other mayflies or stoneflies are common or abundant.

Coloburiscus or spiny-gilled mayfly nymphs are distinguished by their cactus-like gills covering the top of the abdomen. They are most abundant in stony or gravelly, cold water, well aerated streams with some vegetation cover along the bank (riparian), so assigned a tolerance score of 9. The nymphs use their hairy legs to trap drifting food particles (probably both plant fragments and small invertebrates).

Deleatidium mayfly nymphs have a flattened body and single leaf-like gills. They are typically the most abundant invertebrates in many fast-flowing, stony-bottom streams with cool and well aerated water, especially in the South Island, so assigned a tolerance score of 8. This group of mayflies feed by scraping diatom algae and other organic matter from stone surfaces.

Deleatidium mayfly

Coloburiscus spiny-gilled mayfly

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Snails

Potamopyrgus are small, black, brown or pale snails with an obvious spire (point) and found in most streams and rivers. Like most snails they are grazers, scraping biofilms from submerged cobbles and boulders. High numbers of snails are an indication of a long period since any significant flood event. They are found in pristine and polluted waters, so assigned a tolerance value of 4.

Snail Potamorpyrgus

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Free living Caddis Hydriobiosis

Axe-head caddis Oxyethira

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Caddisflies

Oxyethira or axe-head caddis larvae construct small, transparent, mobile cases shaped like an axe-head. They are most common in streams with limited shade, particularly at sites with abundant stream bed algae on which they feed. High numbers of axe-head caddis are usually recorded at sites with abundant streambed algae, which could be the result of nutrient enrichment, limited shade and a lack of recent high flow (algae scouring) events, so assigned a tolerance score of 2.

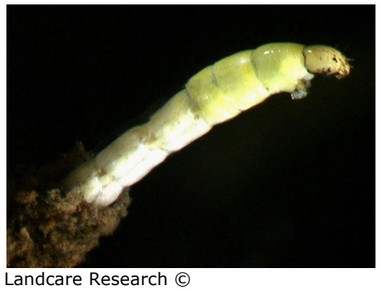
Hydriobiosis or free living caddis have pincers on their forearms, which they use to predate other invertebrates.They are common in stony streams in bush-covered and farmland areas with moderate to good water quality, , so assigned a tolerance value of 5.

True flies

Chironomid midges have a worm-like body form, but with a distinct head, and with paired legs under the head and at the end of the abdomen. They are, are often abundant in unshaded, nutrient-enriched streams with prolific algal growths, so generally assigned a tolerance score of 2 or 3.

Austrosimulium sandfly larvae are found in fast and slow flowing, hard bottom and soft bottom streams in bush covered, farmland and urban areas and can be abundant in pristine streams, but also in poor quality urban streams, so assigned a tolerance score of 3.

Chironomid (Orthoclad) midge



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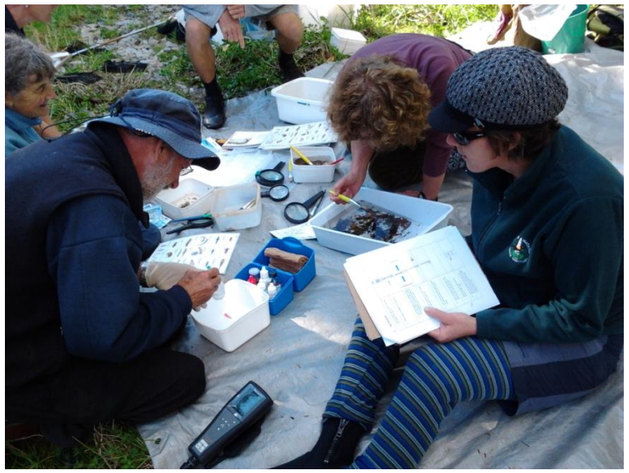
Austrosimulium sandfly

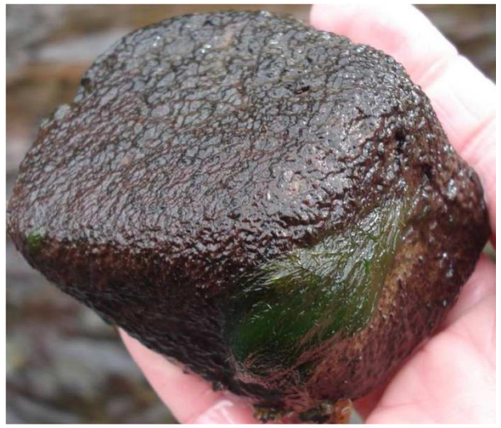
PROJECT MAITAI
Mahitahi

Information Sources and Images: Landcare Research, NIWA SHMAK Guidelines, LAWA website, Cawthron CADDIS database, Peter Hamill. Invertebrates identified by NCC, Friends of the Maitai and Stark Environmental Ltd

Friends of the Maitai / Nelson City Council River Health Monitoring at Riverside



Identifying freshwater macroinvertebrates (bugs)



Periphyton mats with green filamentous algae

Benthic macroinvertebrates (insects and bugs) are widely used as indicators of river ecosystem health because they include a wide range of species (taxa), each with relatively well-known sensitivity or tolerance to river conditions. The macroinvertebrate community index (MCI) is based on the tolerance or sensitivity of species to organic pollution and nutrient enrichment.

The MCI score provides a measure of the ecological health of the river, based on the sum of scores for each taxa, ranging from 1 (very tolerant) to 10 (very sensitive). The Riverside MCI scores in February and August were below 100 (Good), reflecting the lack of rainfall and resulting low flows prior to sampling. Freshwater snails and shrimps were most abundant in February, whereas a more diverse range of species was present in August, including mayflies, caddisflies and shrimps.

Periphyton is the slimy organic layer attached to submerged surfaces such as stones and wood. Periphyton is an important food for stream macro-invertebrates (insects, snails, worms, etc.), which in turn are food for fish and birds. However, when excess growths of periphyton develop, they can make the stream habitat unsuitable for many macroinvertebrate species. This reduces the ecological health of the stream,

An excess growth of periphyton in rivers probably indicates that the stream is exposed to direct sunlight and the water is enriched in nutrients. If there is little periphyton growth, it may be due to low light and nutrients, or because a recent high flow event has removed the periphyton. Sampling frequently (e.g. each month) over a year should show you whether the river is susceptible to excess growths between flood events

River monitoring showed that green filamentous algae was predominant in February, whereas thin mats of single-celled algae (forming biofilms) were predominant in August 2014.

NIWA Parallel Monitoring Project

Friends of the Maitai and Nelson City Council are part of a NIWA national river care monitoring project to directly compare regional council State of the Environment river health monitoring with community river care monitoring. The aim of the project is to assess the scientific rigour of community monitoring to supplement Council monitoring, support community groups to up skill and encourage community participation in the development of local freshwater management plans.

Sampling water for dissolved nitrate

Abundance key: Rare (R)=1-4 animals/sample, Common (C)=5-19, Abundant (A)=20-99, Very Abundant (VA)=100-499, Very Very Abundant (VVA)=500+

Common Name	Families	MCI score	22-Feb-14 Abundance	18-Aug-14 Abundance
	Mayflies			
spiny-gilled mayfly	*Coloburiscus*	9	-	C
single gill mayfly	*Deleatidium*	8	-	A
	Dobsonflies			
toe-biter	*Archichauliodes*	7	R	R
	Beetles			
riffle beetle	Elmidae	6	C	-
	True Flies			
cabbage flies	Anthomyiidae	3	R	R
cranefly	*Aphrophila*	5	R	C
sandfly	*Austrosimulium*	3	-	A
dancefly	Empididae	3	R	R
chironomid midge	*Maoridiamesa*	3	-	R
chironomid midge	Orthocladiinae	2	C	C
horsefly	Tabanidae	3	-	R
chironomid midge	Tanypodinae	5	R	-
chironomid midge	*Tanytarsus*	3	R	R
	Caddisflies			
free living caddis	*Hydrobiosis*	5	-	R
Net building caddis	*Hydropsyche*	4	R	A
free living caddis	*Neurochorema*	6	-	R
axe-head caddis	*Oxyethira*	2	A	-
free living caddis	*Psilochorema*	8	-	R
	Crustacea			
shrimp	*Phreatogammarus*	5	VA	A
	Worms	1	R	R
	Snails			
mud snails	*Potamopyrgus*	4	VVA	C
	Number of taxa		13	18
	MCI		77	91