29th April 2023

Benthic macroinvertebrate data sheet for SHMAK

Record the invertebrates you find. Write R for rare (1-4 animals), C for common (5-19 animals) or A for abundant (20 or more animals). Note red = run, blue = riffle.

	If present; record R, C or A		tolerance score	Write tolerance score if present	
spiny-gilled mayfly			9		
swimming mayfly			9		
flat mayfly (Deleatidium)		R(1)	8		8
Tusked mayfly			8		
Green stonefly			10		
Other stonefly			8		
free-living caddisfly	R(3)		6	6	
Net-spinning caddisfly			6		
Messy-net caddisfly			8		
stick-cased caddisfly			6		
stony-cased caddisfly			6		
smooth-cased caddisfly			9		
spiral cased caddisfly			10		
axehead caddisfly (micro-caddisfly)			3		
dobsonfly		R(1)	7		7
dragonfly			6		
damselfly	C(10)		5	5	
Beetle (larva)			6		
Water spider			5		
mite			5		
backswimmer/water boatman			5		
Water treader			5		
cranefly			5		
sandfly			3		
Mosquito (pupa)			3		
Non-biting midge	A	A	2	2	2
other fly larva			3		
Crayfish/koura			5		
Amphipod	A	A	5	5	5
isopod			5		
seed shrimp (ostracod)			3		
water flea (copepod or cladoceran)			5		
shrimp			5		
limpet			7		
freshwater mussel/kakahi			6		
fingernail clam		R(4)	3		3
flat spiral snail			3		
Mud snail	A	A	4	4	4
Left-handed snail	R(1)	R(1)	3	3	3
leech	C(6)	C(6)	3	3	3
segmented worm	A	A	1	1	1
flat worm	C(5)	R(3)	3	3	3
horsehair worm			6		
Total number of types present (A)	**9**	**10**	**Total of scores (B)**	**32**	**39**

Site score (divide B by A)		**B/A:**	**3.56** **3.90**

General Notes:
Run sampled 8.45am am; riffle 10.30am.

Temperature of water at 8.45am: 12°C
pH ~6.5
Water normal.
Clarity not done but clear.
Weather fine, no recent rain in last few days but water has been high (~2/3 way up bank recently)
Willow weed has been removed over the last few weeks.
Weed: ≈20% coverage in run, average of ≈40% coverage in riffle (50% run x 10% cover + 50% riffle x 70% cover = 0.05 + 0.25 = 0.40)
Bed: run reach largely gravel with some medium to coarse sand mixed in (sandy gravel), riffle reach comprised of coarse gravel delta with a few cobbles (cobbly gravel) over first part and sandy gravel in second part (run).

Flow at GWRC's Whites Line East gauge: 260 litres/sec at 9.05am.

The riffle which had developed in the original run section is still present. There is a run at the upstream end of the reach and a riffle in the middle of the reach which transitions back to a run at the end.

The original riffle section features a cobbly gravel delta (probably formed by sediment material washed through the Mission St culvert) with very shallow flow depths over the first part. There is a sharp drop-off from the cobbly gravel delta gravel with transitions to a fairly deep run (≈400 mm deep).

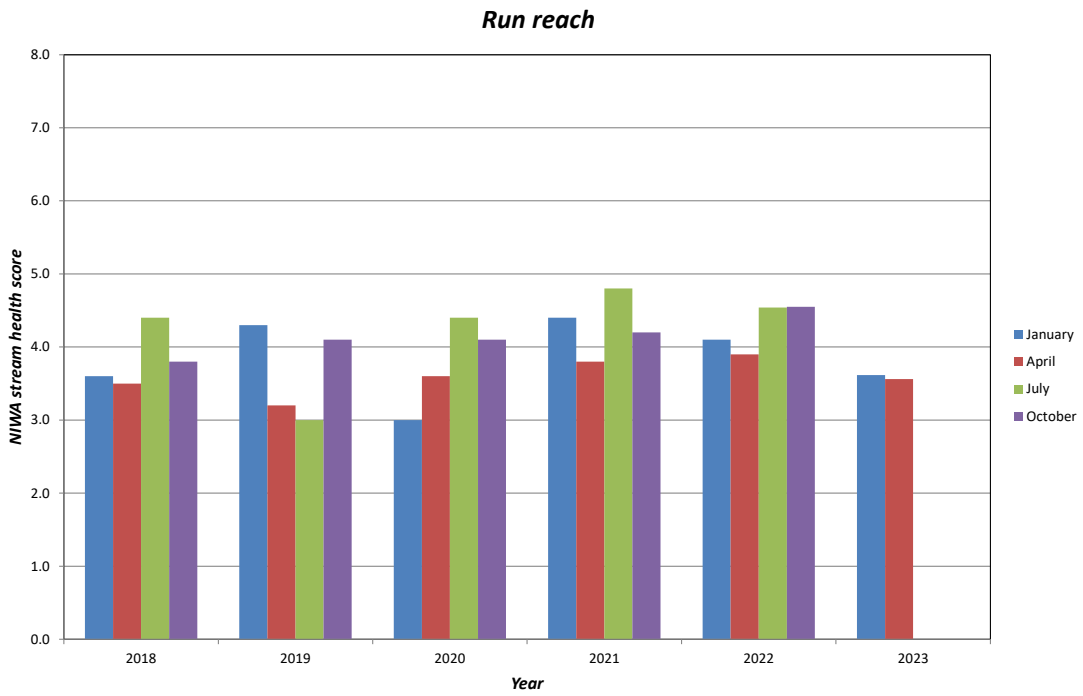
Note that the beach which used to be present along the right bank immediately downstream of the sharp 90 degree bend between the riffle and run sections (where the old poplar tree used to be) is now no longer present. You step off the bank into ≈150-200 mm deep water.

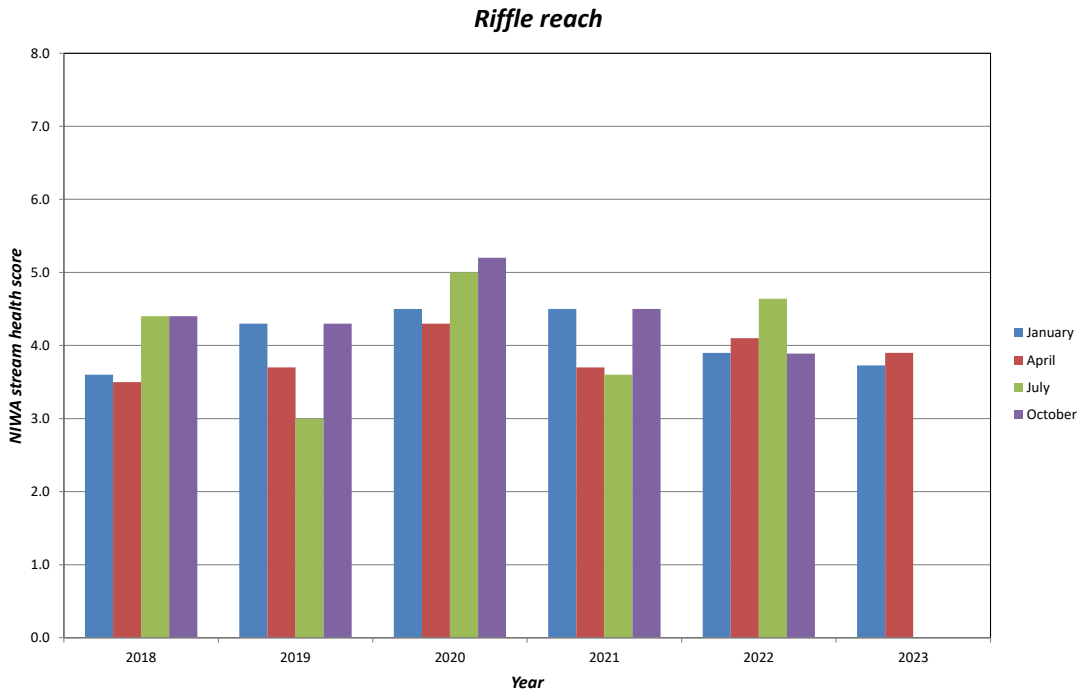
1 large (10cm) inanga and 1 bully (giant?, 6 spines on dorsal fin) ~ 4cm caught in run section

Graphs – Stream Health Scores Over Time (see below)

0-4 Poor
4-5 Fair
5-6 Good
6-8 Excellent

Results sent to GWRC and entered into NZ Water Citizens database (NIWA plus all some councils)



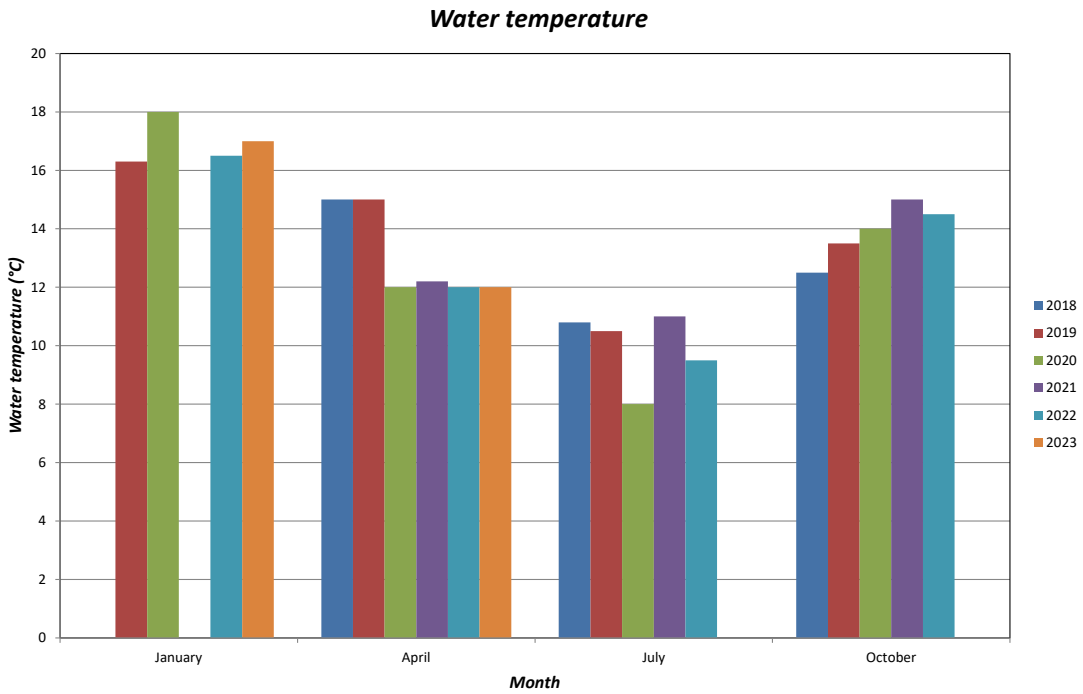


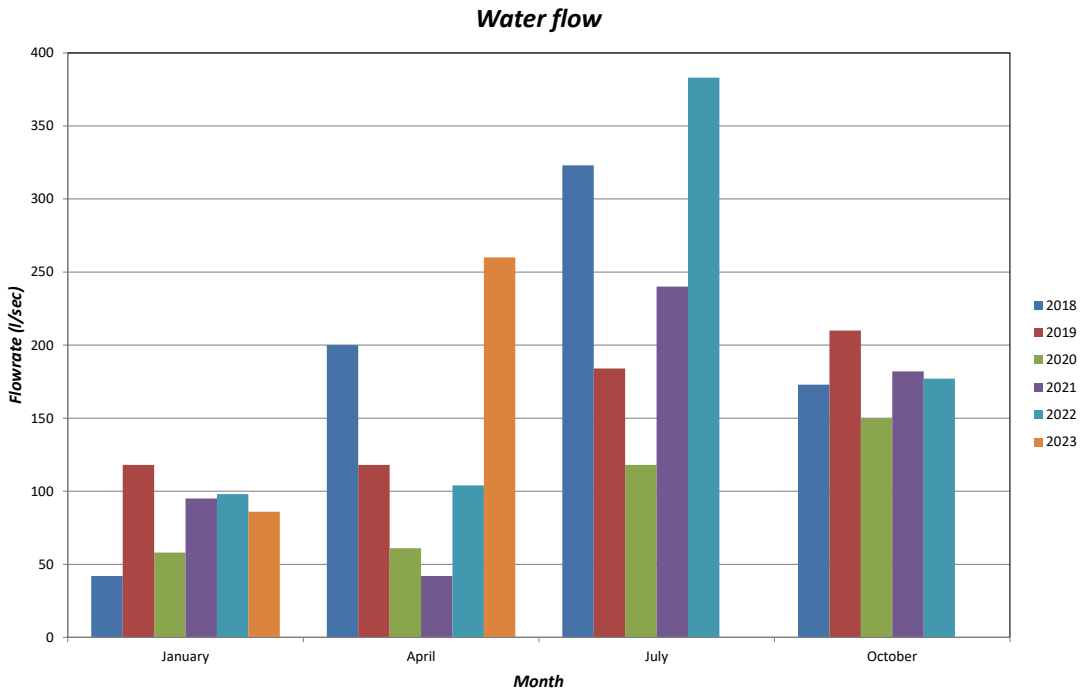
The stream health score (SHS) for the run section (3.56) closely matched the SHS from the January survey reflecting a trend of marginally lower scores than in 2021 and 2022. The SHS is more in line with the scores we were getting up to April 2020.

The SHS for the riffle section (3.90) also closely matches the SHS from the January survey. The SHS is largely in line with other scores at this time of the year except in 2020 when it was slightly higher.

The water temperature is almost identical to that measured at this time of the year in 2020, 2021 and 2022 but up to 1.5° colder than in 2018 and 2019. It is dependant on the weather conditions/night temperature.

The streamflow (260 litres/sec) was the highest flow recorded at this time of the year from all surveys. The magnitude of the flow was more typical of that measured in July.





Photos

Figure 1: Damselfly (tolerance score 5)

Figure 2: Damselfly (tolerance score 5)

Fig 3: Dobsonfly larva (tolerance score 7)

Fig 4: Free living caddisfly (tolerance score 6)

Fig 5: Fingernail clam (tolerance score 3)

Fig 6: Mayfly (tolerance score 8)

Fig. 7: Worm (?*Dero digitate* from eDNA data) found in riffle