

Freshwater ecology monitoring programme: measuring stream health



Olinga

Defining the stream type

We use data collected from macroinvertebrate monitoring to assess the ecological health of streams (see our *Freshwater ecology monitoring programme: background* info sheet for more details). But not all streams are created equal – different types of streams are home to different types of macroinvertebrate communities. So, before we can use our macroinvertebrate data we need to classify the type of stream they come from.

To ensure we're comparing apples with apples, we've grouped the 120 streams we monitor into three types, based on their geology and how steep they are (in technical speak their biophysical classification):



NON-VOLCANIC on any gradient

Catchment dominated by non-volcanic material (e.g., hard sedimentary) and on any slope.



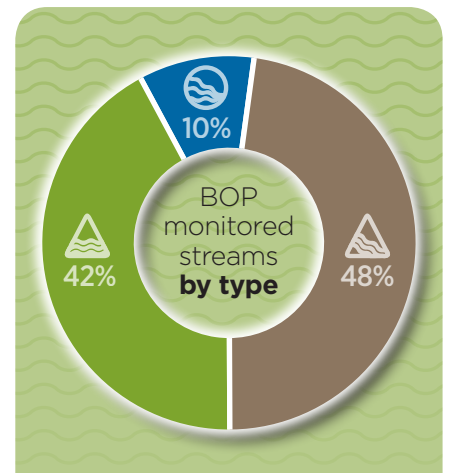
VOLCANIC on a STEEP gradient

Catchment dominated by volcanic geology with an average catchment slope of more than 20°.



VOLCANIC on a GENTLE gradient

Catchment dominated by volcanic geology with an average catchment slope of less than 20°.



As we are aiming to track the impacts on freshwater ecology from changes in land use, we also note whether streams run through native forest, exotic forestry, agricultural or urban areas as part of our monitoring programme.

Making macroinvertebrates into measurable metrics

The aim of any monitoring programme is to provide consistent, trustworthy and useful results at the end of each monitoring round. Our freshwater ecology monitoring programme is built around a process developed specifically for our region – the Bay of Plenty Index of Biological Integrity (BoP IBI). The BoP IBI is a way to turn our macroinvertebrate data into multiple 'metrics' (standard numerical measures providing a simple number describing different aspects of the invertebrate community).

The first thing we do is find out what types of macroinvertebrates were found at each site, and how many of each were present. We then summarise the invertebrate data using different metrics. There are lots of different metrics available, including:

- whether there were lots of different types of macroinvertebrates present or just a few (Richness)
- how many macroinvertebrates very tolerant of degraded conditions were present vs very sensitive species (Macroinvertebrate Community Index, MCI)

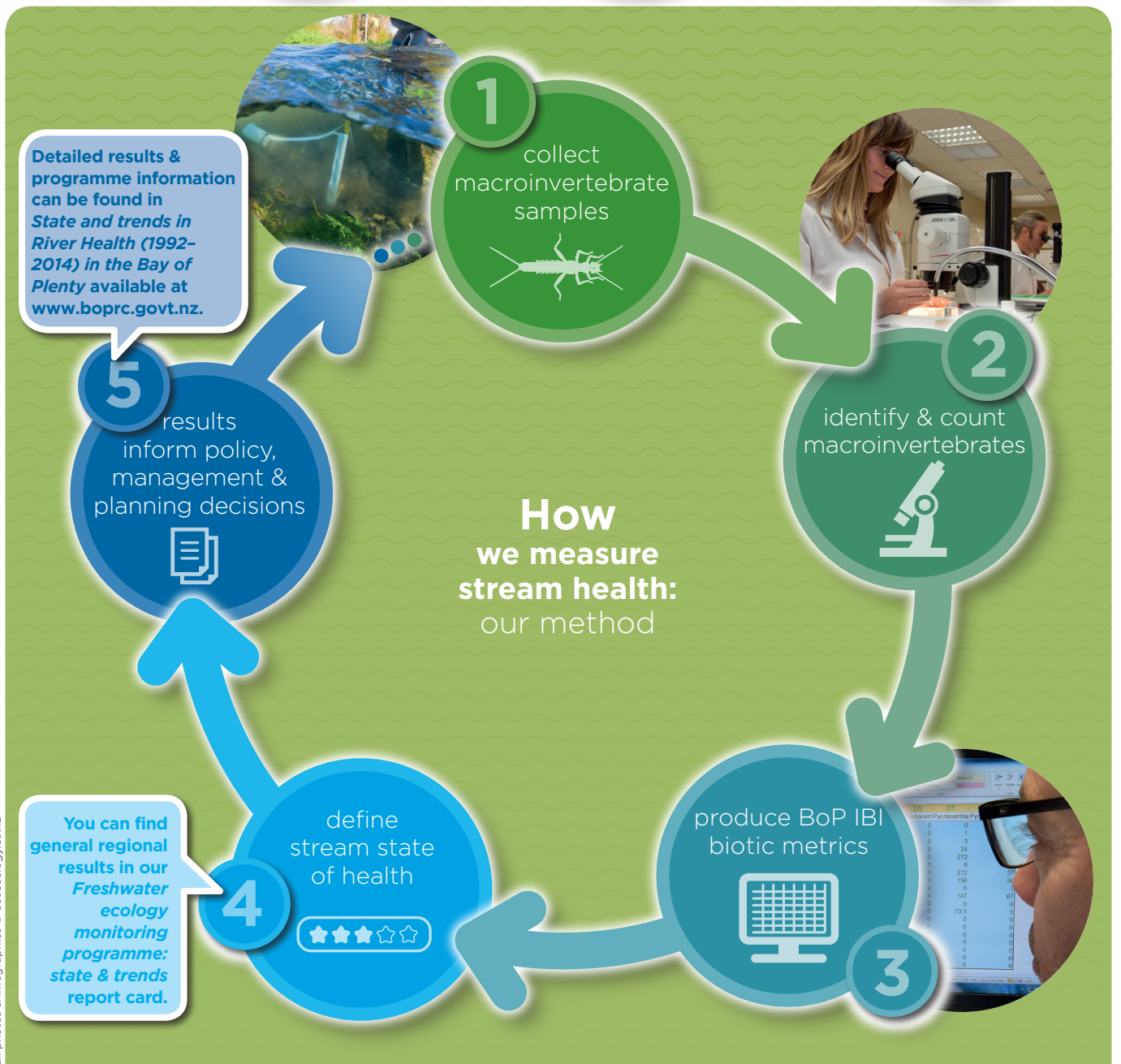
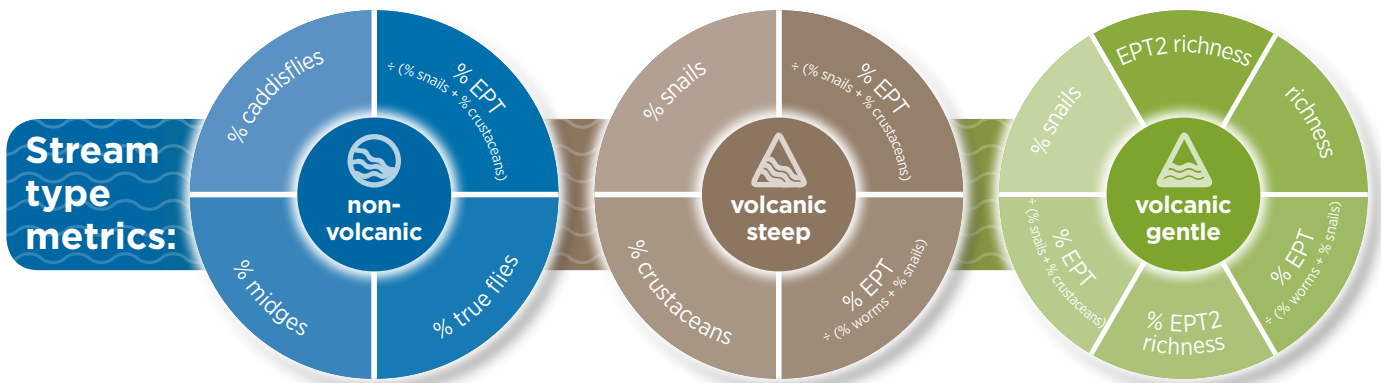
- what percentage of those macroinvertebrates present are known to prefer healthy streams e.g. mayflies, stoneflies, caddisflies (Ephemeroptera-Plecoptera-Caddisflies, EPT)

...plus many more.

As we are specifically interested in the impacts of land use change we've collated our own selection from all the metrics available to make up our multimetric BoP IBI index. This gives us a single value for the state of health for each stream.

We have a different set of metrics for each of the three different stream types we discussed above. See over the page for the specific metrics used for each type of stream.





all photos & infographics © eosecology.co.nz

For more information on freshwater ecological monitoring undertaken by Bay of Plenty Regional Council, contact us on 0800 884 880.

