

Student 4: High Achieved
 NZQA Intended for teacher use only

Purpose: To investigate the distribution of *Potamopyrgus antipodarum* in the Waihopai River.

Hypothesis:

The population of the snail *Potamopyrgus antipodarum* from the Waihopai River dam to Queen’s Drive will not significantly change down the river, but will change across the river because of the speed of the current and the amount of periphyton (the algae food source found on the beds of streams and rivers).

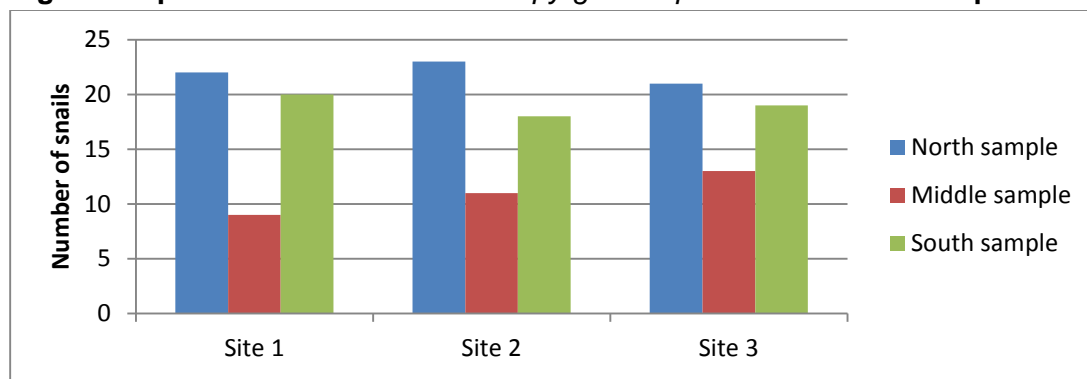
1

Raw Data – Population of *Potamopyrgus antipodarum* at each sample site in the Waihopai River

	Site 1	Site 2	Site 3	Average
North sample	22	23	21	22
Middle sample	9	11	13	11
South sample	20	18	19	19
Average	17	17	18	17.3

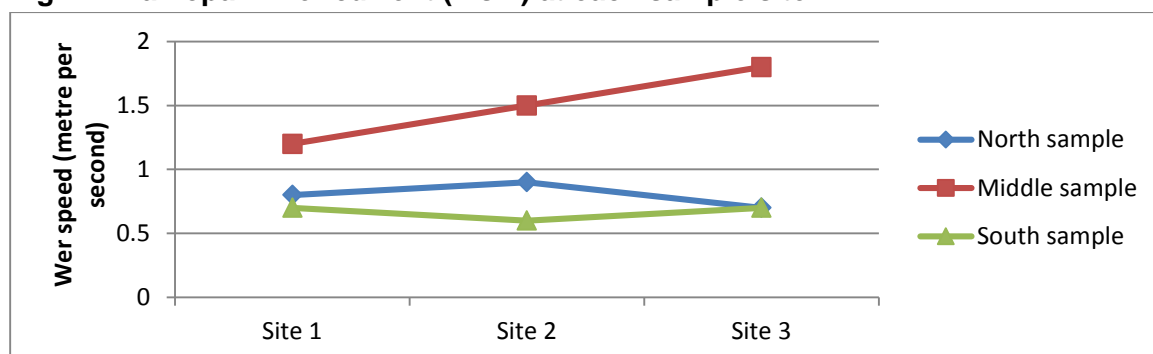
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Fig. 1 – Population number of *Potamopyrgus antipodarum* in the Waihopai River



2

Fig. 2 - Waihopai River current (ms⁻¹) at each sample site



2

Conclusion:

Fig. 1 shows that the population number of *Potamopyrgus antipodarum* is similar along the river between the Waihopai dam and Queen’s Drive. The population numbers change across the river’s width; the north and south sides had similar numbers, while the middle had the least.

3

Discussion:

This pattern was linked to the speed of the water and the amount of algae on the gravel. The Waihopai River was modified by human intervention to run straight some years ago. Therefore the distribution of *Potamopyrgus antipodarum* across the river must be affected by other factors like the speed of the current in different sample sites across the river, and the growth of the algae (periphyton food source of the snails).

4

The current is necessary for the respiration of many benthic invertebrates and reproduction of some fish species (Hynes 1970). Currents distribute oxygen, nutrients and food down a river system – detritus for invertebrates and drifting insects for fish and birds.

5

The Waihopai River where the investigation was carried out runs east to west and is reasonably straight. This means the north side has shading from the bank whereas the south side does not. However, the data in Fig. 1 show that there were more snails on the north side of the river than the south side.

4

Potamopyrgus antipodarum is an algae grazer (stated on the Landcareresearch.co.nz website), so it is more likely to expect snails to live in an area with a higher amount of its desired food source.

5

This trend is also seen in student Y's data, along and across the river. The samples taken of current showed similar trends across the three river sites; the middle had the higher water speed compared with both sides (Fig. 2). The trend of the snails' numbers (Fig. 1) shows a relationship with the river speeds collected - where the current is slower at either side there is a greater number of *Potamopyrgus antipodarum* found compared with the middle of the river. The speed of the water also plays a large part when it comes to the algae growth, where the river is fast its growth is disrupted and where it is slow its growth is not affected.

5

Quinn and Hickey (1990) state that it is the quality of the habitat that is provided by the flow that is important to stream life. Without good flows the stream becomes a lake or pond. An average velocity of 0.3 m/s tends to provide the conditions for most stream life and will prevent the accumulation of fine sediment.

5

Fresh water systems that have a high water velocity do not have a high density population of *Potamopyrgus antipodarum* (Statzner & Holm, 1989). This may be due the low dissolved ions concentrations in these waters (Herbst, 2008).

5

The New Zealand freshwater snail has been shown to display a preference for sediment-contaminated cobbles and the presence of filamentous green algae (Suren, 2005). This report also back's up my findings as I found that the fast currents had cleaned most the rocks in the centre of the river and found the least amount of snails, the sides of the river showed green algae and moss and the most amounts of snails. I feel this is why *Potamopyrgus antipodarum* population is determined by the river's velocity.

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