

THE STREAM

NEWSLETTER FROM
CASHMERE STREAM CARE GROUP (CSCG)
AUGUST 2018



Fine sediment entering the water column
in Cashmere Stream

photo © Shelley McMurtrie

IN THIS ISSUE: Too much brown, not enough blue Cashmere Stream water clarity results How suspended sediment impacts stream health

SPECIAL EDITION Too much brown, not enough blue



photo © Robin Smith

One example of how fine sediment gets into Cashmere Stream – sediment runoff from a development swamping sediment control measures

The catalyst for this newsletter was the International Erosion Control Association conference being held in Christchurch in August 2018. The conference theme of *'More Blue, Less Brown and Lots of Green – when science and engineering come together in beautiful ways'* struck a chord with us.

It's our organisation's goal to have **more blue, less brown** and **lots of green** to bring about a recovery of our cherished Christchurch waterway. But the water quality science is telling us that we have a long way to go to meet this goal – there's too much sediment reaching our waterway.

Results from our eight years of water clarity monitoring at 19 sites in Cashmere Stream reveal a bleak scorecard for the stream's health. Analysis of our over 4,000 water samples shows that 76% can be categorized as 'poor' to 'extremely poor' for water clarity. Simply put, there's too much brown sediment. The 2,800 ha Cashmere Stream catchment has nearly 50 km of drains and tributaries. Although rising from springs on the Plains, over half its catchment is ephemeral tributaries draining

the Port Hills. It's these hill tributaries that account for the poor water clarity – especially Worsleys Drain, Cashmere Valley Drain, No 3 Drain, and Hoon Hay Valley Stream.

The Port Hills have a cover of loess, which is a very fine wind-blown silt. They were originally covered with forest, but fires centuries ago, and more recent agricultural and urban development have exposed their easily erodible soils. The 2017 fires and subsequent forest harvest have added to the influx of sediment.

Suspended sediment is the biggest water quality issue for Cashmere Stream. The water clarity monitoring results are proof that something needs to change. There's just **too much brown**.

Cashmere Stream water clarity results

- CSCG monitoring sites:
- **HILL TRIBUTARY**
 - **PLAINS TRIBUTARY**
 - **MAIN STEM OF STREAM**
- Hill tributary catchments
 - Waterway
 - Hill waterway (usually dry)
 - Road boundaries

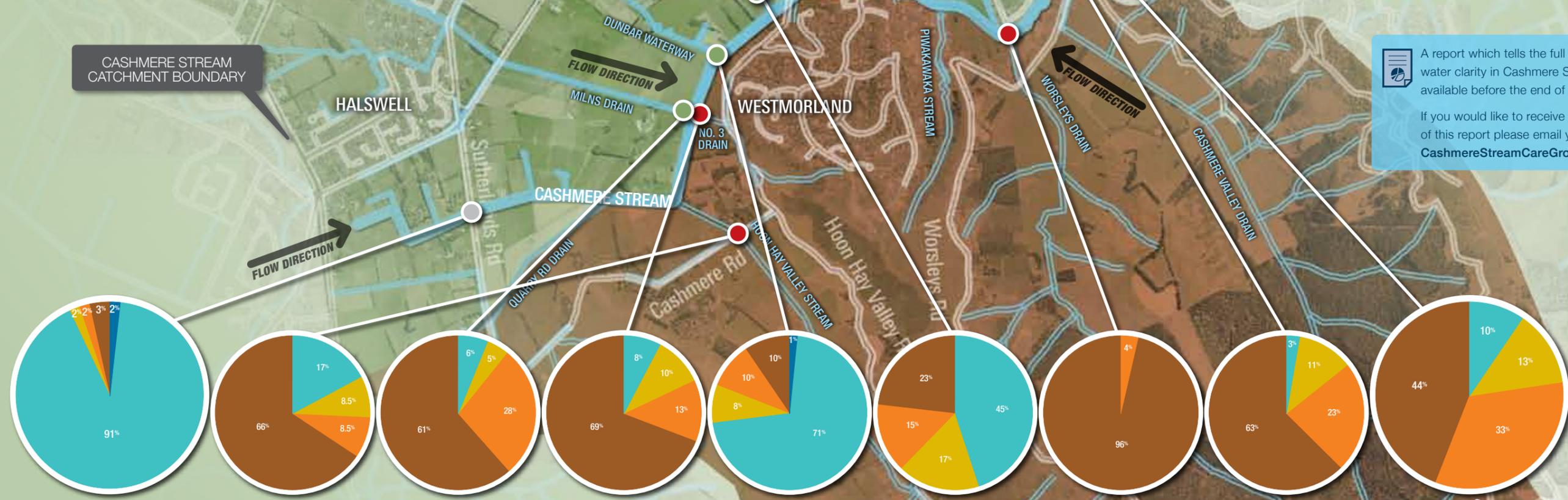
Water clarity in Cashmere Stream progressively gets worse along the length of the main stem. The average water clarity reading goes from: 88 cm in the headwaters = 'very good' to 38 cm at the downstream end = 'very poor'. This is mainly due to poor water clarity from tributary waterways, especially hill tributaries. At a water clarity reading of 9 cm ('extremely poor') the hill tributary Worsleys Drain had the lowest average clarity reading of all monitored sites.

NOTE: this map only shows a subset of all the sites monitored by CSCG.

48% of **PLAINS TRIBUTARY** samples fall into the **EXTREMELY GOOD** or **VERY GOOD** water clarity categories

85% of **HILL TRIBUTARY** samples fall into the **EXTREMELY POOR** or **VERY POOR** water clarity categories

A report which tells the full story about the water clarity in Cashmere Stream will be available before the end of 2018. If you would like to receive a digital copy of this report please email your details to: CashmereStreamCareGroup@gmail.com



Note that we start with lots more 'blue' in the main stem, then we gather more and more 'brown' as the hill tributaries flow in, reducing water clarity.

- Water clarity categories:
- **EXTREMELY GOOD**
 - **VERY GOOD**
 - **POOR**
 - **VERY POOR**
 - **EXTREMELY POOR**

The pie charts above show that the worst offenders for extremely poor water clarity are the **hill tributaries**, and one of the plains tributaries (Milns Drain). This significantly impacts on the water clarity of Cashmere Stream main stem, which goes from having 93% of samples in the 'very good' or better water clarity category in the headwaters, to only 10% at the downstream end. This also reduces water clarity in the Ōpāwaho/Heathcote River, which Cashmere Stream flows into.



How suspended sediment impacts stream health

Sediment in a stream is natural, but too much can cause problems. Excess sediment can block light for algae, harm fish gills and filter-feeding invertebrates, smother habitat and adversely affect visual appeal. The fine loess sediment from the Port Hills stays suspended in the water column, causing problems further downstream in the Ōpāwaho/Heathcote River and the Avon-Heathcote Estuary/Ihutai.

All the following species are impacted by suspended sediment in some way:



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WAYS TO REDUCE SEDIMENT INPUT:

There's no single measure that will significantly reduce sediment input and lead to improving the health of Cashmere Stream. A combination of the following are needed...

Ensure:

- better auditing/checking that sediment control rules are strictly adhered to
- hill subdivisions use stormwater treatment systems that work for hill catchments
- the steeper and most erodible slopes in the catchment are revegetated
- the lower reaches of hill tributaries are transformed into shallow, wide wetlands
- all tributaries (hill or flat) are fenced and planted.

Avoid:

- forestry on steep erosion-prone soils
- over-grazing of hill pasture
- allowing urban developments to have exposed soil during the winter months
- unnecessary cutting of hillside slopes.

How CSCG is helping improve the health of Cashmere Stream

The CSCG is active in the catchment on a number of fronts:

- **Environmental watchdogs** – group members record water clarity at multiple sites throughout the catchment, to pinpoint sites of concern and highlight the need for more effective remedial action. This is ongoing since 2010.
- **Advocates** – we make submissions on public policy and resource consents, to promote more effective sediment and erosion control requirements and promote the establishment of wetlands and riparian planting.
- **Better solutions** – we have worked with developers to trial new measures to control erosion.

- **On the ground action** – we work with landowners and local authorities to restore waterways through fencing, planting and habitat enhancement.

DO WE NEED TO DO MORE TO HELP CASHMERE STREAM?

We need greater awareness of the sediment problem, a fresh look at current practices and a determination to strive to improve the health of our land and our water. That's the challenge for all of us – as catchment residents, land owners, land developers, policy makers, planners, scientists and practitioners.

Restoration of Cashmere Stream



photo © Robin Smith



Let us know your comments & find out what else we're up to at...
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