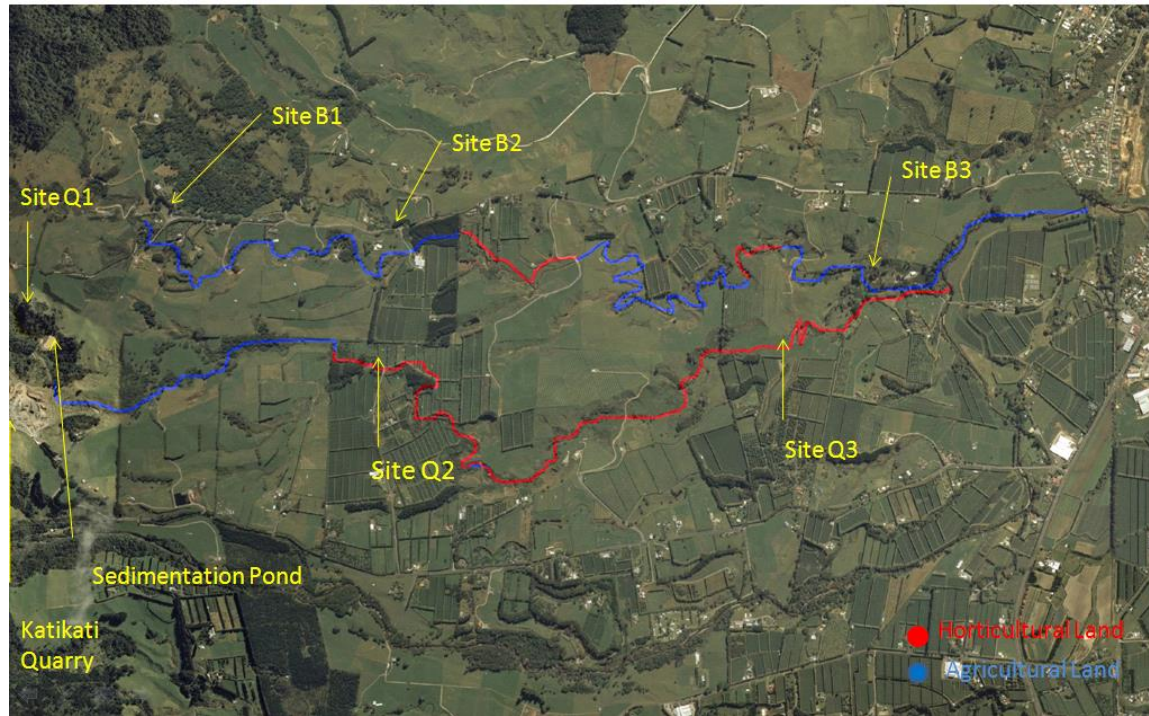


Uretara Catchment Sediment Study 2005



Background

- The Uretara River is located west of and runs through Katikati township where it is a part of a featured walkway, before draining into the Tauranga Harbour. The water of the Uretara is sourced from many streams and springs which mostly originate from the upper reaches of the Kaimai Ranges. The upper catchment of the 2 monitored streams, the Boyd and Quarry Streams, is indigenous forest. The land use differs along the boundaries of these two streams, from predominantly agriculture along the stretches of Boyd Stream, to the contrast of horticulture, along with the presence of an operational quarry, just below the bush line. This quarry adds to the challenges faced by environmental groups in their efforts to restore the health of the Uretara Catchment.
- The first part of the Boyd stream is bordered by bush, with stable well-vegetated banks. The remaining stream bank is mostly well vegetated, but small areas of erosion have been identified. Only a small portion of this stream has developed riparian margins with several vehicle and livestock over-bridges along its course.
- The Quarry stream catchment comprises of approximately 50% steep bush and 50% rolling to easy contour farms and orchards (predominantly kiwifruit). At the point where it flows into the Uretara, through Katikati, the catchment area is 24.4km².
- The Uretara Estuary Managers group have concerns for the level of sediment in this river, contributed predominantly from this operational quarry. Over years they have noticed a decrease in the macro-invertebrate (e.g. koura) and vertebrate (e.g. fish and eels) populations an overall degradation of the river system as well as increased localized mangrove development .

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BOYD AND QUARRY STREAMS

Date : Fri 01 Aug 2008

Scale 1 : 20000

Operator : MLB



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Summary of Monitoring program for Uretara River Catchment – Sediment

- A comparison was made between sediment production from traditional land use (horticulture and agriculture) in contrast to that of an operational quarry.
- Water samples from 3 aligned sites on both streams were collected on 15 occasions representative of 3 different water flow rates. The quantity of suspended solids was measured in each 1 litre sample to enable comparison of the sediment inputs between these sites.
- The relationship between water flow, sediment production and sediment dispersal along the streams was established.
- The average volume of water in both streams was calculated to evaluate the approximate amount of sediment transferred out of these two streams, filling the downstream catchment and estuary.

Boyd and Quarry Streams – Monitoring program summary

Aim:

The aim of the monitoring program was to establish the sediment load of Quarry stream in comparison to Boyd Stream.

Methods used to achieve the aim:

Six sample sites were selected, three on each stream, at similar distances along.



Boyd stream Site 1



Boyd stream Site 2



Boyd stream Site 3



Quarry stream Site 1



Quarry stream Site 2



Quarry stream Site 3

Methods:

- Six sample sites were selected, three on each stream, at similar distances along (see previous slides for site positions and photos).
 - Water grab samples were collected on 15 occasions, 5 in low water, 5 in medium water flow, and 5 in high water flow between the months of April to September.
 - Total suspended sediment and stream velocity was calculated from samples collected on the 15 occasions.
 - Water was filtered using the below apparatus and filter papers were weighed at local Regional Councils Laboratory.
- The dry weight of the sediment covered filters was recorded in excel and statistical analysis was carried out on these results.



Results – Sediment Study

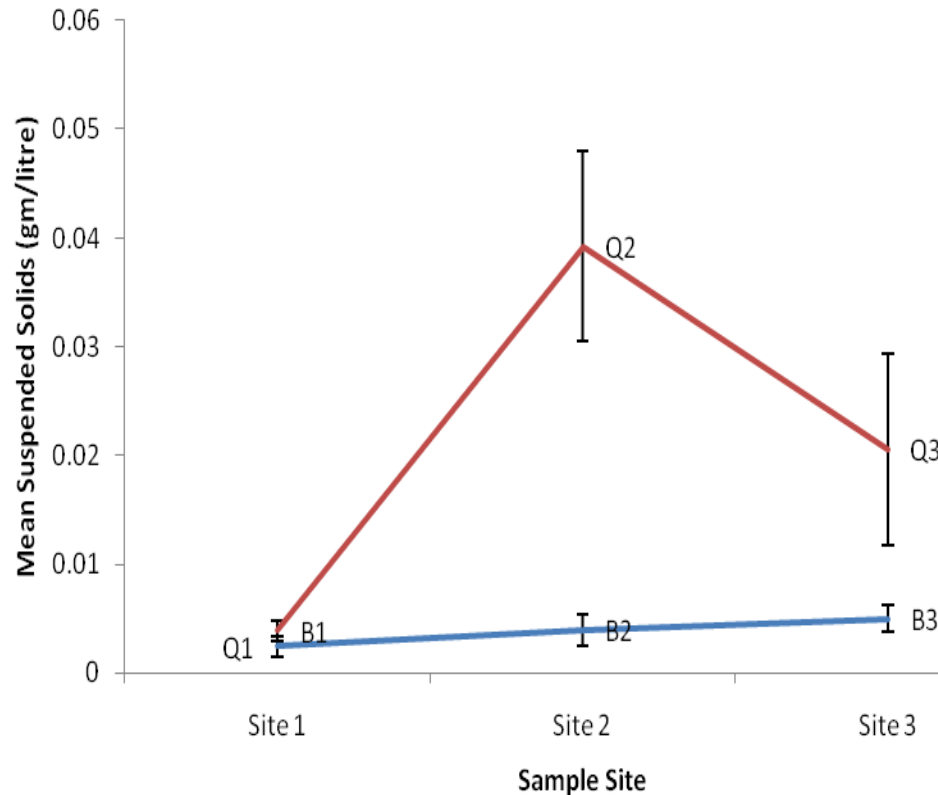


Figure 1 Suspended solids (in grams) collected from Boyd and Quarry streams where Site 1 represents baseline site, Site 2 and Site 3 normal horticulture and agricultural land. Between Site 1 and Site 2 on Quarry stream is point source discharge, therefore increased sediment load, at Q2, and some sediment settling in the stream network before reaching Site Q3.

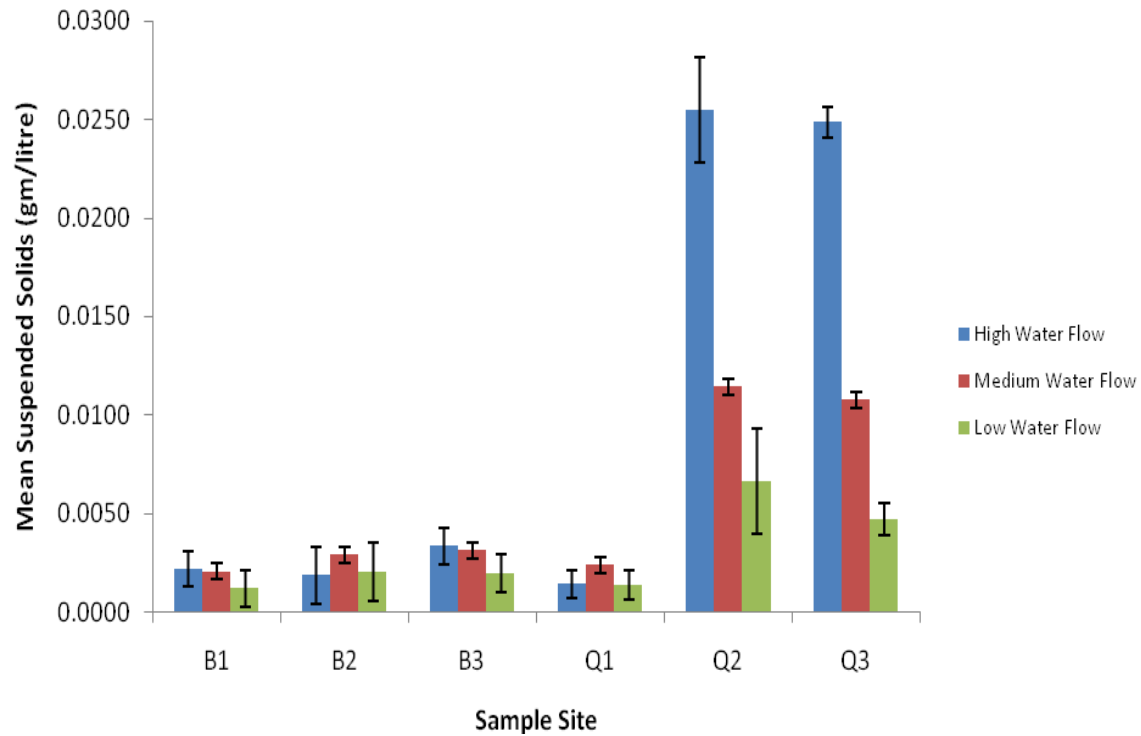


Figure 2 Rainfall/ Water flow versus mean suspended solids in the streams (CI± 95% n=15). Sites B1 through to Q1 not significantly affected by increased rainfall and velocity. Sites Q2 and Q3 downstream of the quarry were significantly affected.

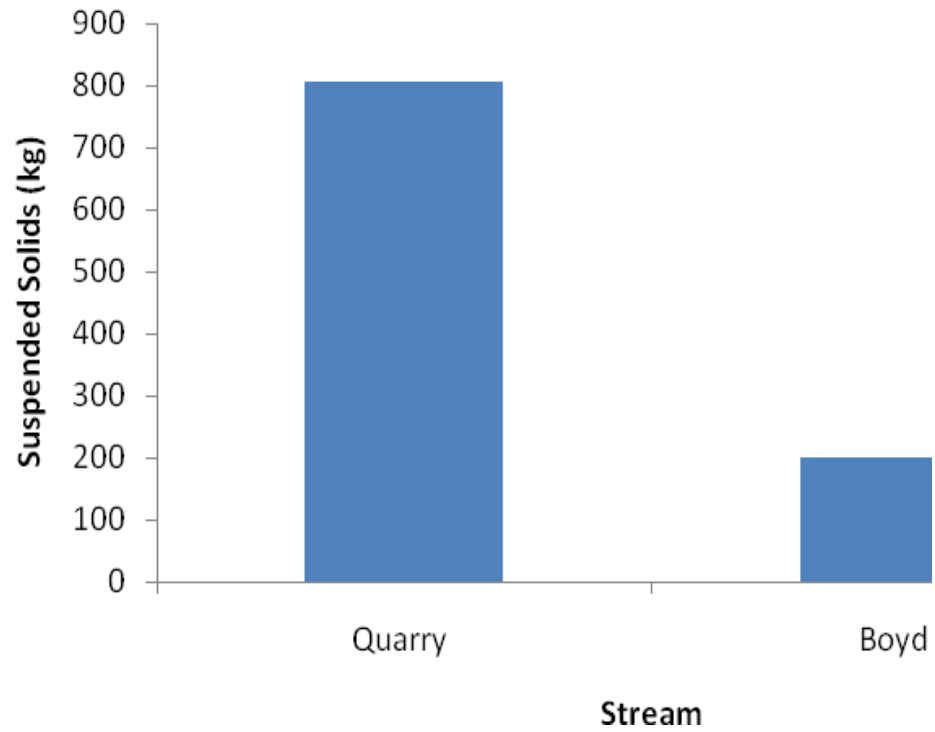


Figure 3 Kilograms of suspended solids transported through water column, potentially delivered to estuary, over 1 day (24 hrs). Quarry stream > 800kg, Boyd stream <200kg.