



LEARNING WATERS

A Waitakere City Council newsletter on water education initiatives to all schools in Waitakere City - Term 2 2005

Dear teachers,

This edition of 'Learning Waters' Waitakere City Council's newsletter to teachers in support of water-related sustainability brings you

- A new way to look at water quality in your closest river
- The opportunity to register for our annual workshops for teachers, and
- A glimpse of a new resource that we have been developing in partnership with Te Kawerau a Maki Trust

As always, please feel free to contact me if your class or syndicate would like support for stream studies or help with workshops and field trips, in terms three or four. There are also resources to study water supply and wastewater topics.

Regards
Sue Langton
Public Affairs Advisor
Environmental Education



Animals ready to go on a mural at Laingholm School in Term 2.

Underwater photography made simple



Ruby Jones, Waitakere's Wai Care coordinator and I have been working together to develop workshops that include underwater and stream bank images of local streams. These will be used with the results from field trips or for class-based workshops that use water quality data and macroinvertebrate samples collected and brought into the classroom.

These photos allow students to see the worst examples of pollution in the lower reaches of many of our urban streams and also to really enjoy the underwater images of the unpolluted upper reaches of these catchments.

This in turn, highlights the real impacts of our lifestyles on the native freshwater animals that live in the rivers and provides motivation for behaviours that reduce our impacts on streams.



How to take underwater photos

It is not necessary to have an expensive underwater camera to take good underwater photos. Here is the method we used – a digital camera and a transparent plastic container!

Tips:

- Turn the flash off, or you will get reflection off the side of the container
- Point the camera sideways to the current or downstream
- Be careful to not walk upstream of the camera which would disturb sediment

CASE STUDY OF THE OPANUKU RIVER *By Ruby Jones*

You can use photos to help your students understand what's going on as described in our comparison of two sites below.

Site 1 - Upper Opanuku Stream These photos were taken in the upper reaches of the Opanuku Stream, in Henderson valley. As you can see, the plants provide shade; keeping the stream cool and we know that the trees also provide organic matter for the animals in the stream, particularly for those invertebrates that eat decomposing leaves and wood. These stream-living invertebrates and those that fall into the water are, in turn, an important food for our native freshwater fish. In addition you can see the stony river bed, which provides good places for fish and invertebrates to live.

Invertebrates we would expect to find at this pristine site are mayfly, stonefly and caddisfly larvae as well as koura (freshwater crayfish), shrimps, snails and freshwater limpets. There would also be worms and crane fly larvae, which can live almost anywhere. The underwater photo shows us that the water is clear. We would also expect it to have high levels of dissolved oxygen as is shaded and fast-flowing. In fact we found: **Temperature:** 7°C (If the water goes above 20°C, it gets too warm for the fish to survive.) **Dissolved oxygen:** 11.8 mg/L (If the dissolved oxygen sinks below about 3mg/L, then fish and invertebrates have trouble breathing.) **Clarity:** 75 cm (Clarity is a visual measure of the amount of suspended solids in the water.) Mud and sediment reduce the distance we can see through a tube of water. The particles of mud can cause real problems because they can clog gills of fish and invertebrates, make it difficult for fish to see to hunt their prey and smother the streambed, preventing the growth of beneficial algae. The **nitrate** values of 0 mg/L are what would be expected as there is no garden fertilizer or other nitrogen enrichment from animal wastes getting into the stream, as the upper catchment is all native bush.

Site 2 - Lower Opanuku Stream These photos were taken in the lower (urbanised) reaches of the Opanuku Stream. As you can see, there is not much streamside vegetation, other than the grass and flax, which provide little shade. The banks are quite steep and unstable, with erosion scars and as a result, the stony streambed has mud and silt between the rocks. The water is murky, getting worse when it rains and there is often rubbish, such as plastic bags, in the stream. We would expect to find fewer different kinds of invertebrates here. Our survey supported this as we found mayfly and caddisfly larvae, shrimps, snails, worms and crane fly larvae. We also found the rare freshwater crabs at this site. The water quality data also supported our expectations from the photographs. Recorded temperature was warmer at 12°C, dissolved oxygen was less at 9 mg/L and water clarity was significantly reduced at 35 cm. So, at site 2, the water quality and habitat were inferior to Site 1 as indicated by the underwater and riparian zone photos.



Site 1



Site 2



Ruby and I hope that you find time to try these photographic techniques, as they enable your students to get to know different parts of your closest stream even without a field trip. This leads naturally to discussions about daily behaviour changes that can start to reduce human impacts.

Please contact me for details to help with these class discussions and I can always respond to letters, faxes, phone or email enquiries from your students.

REGISTER FOR FREE WORKSHOPS IN TERM 4

We are planning to run introductory workshops again at the beginning of term 4 to:

- Provide an introduction to the issues around stream pollution and time to meet iwi representatives
- Outline programmes happening in primary and secondary schools, in partnership with the teachers who have been running them
- Give you practice in macroinvertebrate sampling and water-quality testing techniques to use on stream field trips
- Give you the opportunity to tell us about your programmes and the support you need to further develop your programmes.

TO REGISTER: PLEASE COPY THE BACK PAGE OF THE NEWSLETTER, FILL IT IN AND FAX IT BACK OR EMAIL ME.

Remember that we will reimburse the school for the cost of two relievers for the day, to enable two teachers to attend at no cost to the school. (More than two teachers from each school are, of course, most welcome to attend.)

We are also considering the possibility of offering an optional second day as part of this workshop, so that you are able to develop some units of work using the resources we have on hand. Please indicate if you would be interested in this option.



Dougal Strahan from Liston College and Graham Leonard from Waitakere City Council hosting a field trip last year.

...STOP PRESS...STOP PRESS...STOP PRESS...

A WORD FROM TE KAWERAU A MAKI TRUST, TANGATA WHENUA FOR WAITAKERE



Kia ora guys,

Wow, have we got a story to tell you. Ever wonder what it was like to be a native freshwater fish like a redfin or common bully in a Waitakere stream in 2005?

Well, you might just get to find out - join us as we travel upstream to meet the taniwha who protects it. Our animated adventure, "The Guardians of the Mauri", will be coming to your school soon. There is also a Maori version - 'Nga Kaitiaki o te Mauri'!

P.S. Please email me on EnviroEd@waitakere.govt.nz to tell me whether your school has a DVD player, as I am planning to provide each school with a DVD copy of this movie, but could make some VHS copies if you request them now — Sue

For more information:

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Waitakere City Council
Te Taiao o Waitakere

Visit our website www.waitakere.govt.nz

REGISTRATION TO ATTEND PROFESSIONAL DEVELOPMENT 2005

Sponsored by Waitakere City Council

We encourage two teachers from each school to enrol together, as environmental education is most effective when it is a cross-curricular unit of work.

Name of school:

Your name:

School address (postal):

Phone no:

Fax no:

Email:

Your email or phone contact:

Please tick your preferred option:

- One introductory day only
- The introductory day and a follow-up day
- A follow-up day only

Please circle your preferred dates in October:

Tuesday 18 Wednesday 19 Wednesday 26 Thursday 27 Friday 28 No preference

(Please cross dates out if they are totally unsuitable.)

You may fax this page or return it by post. Registrations to my email address are fine too. Please make sure that you register by Friday 16th September, by sending a separate enrolment form for each staff member. Please contact me if you have any further queries.

Contact details:

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