

Auroa Continuing School

The four junior classes from Auroa Continuing School sampled the Kaipokonui River at Thoumine Park in Kaponga earlier this term. With the help of a wonderful group of parents they were able to catch a good range of invertebrates. They displayed great skill in classifying the creatures.



Auroa students and helpers.

Macroinvertebrate monitoring

There is absolutely no doubt that this activity remains a favourite with students at all levels. The obvious interest and attention to detail displayed by the pupils is a great thrill. This term has involved pupils from Stratford, Hawera, Waitara and New Plymouth Boys high schools, St Mary's School and Sacred Heart College at the secondary level as well as Toko, Stratford, Auroa, Westown, St Joseph's Opunake and St Joseph's New Plymouth primary schools. Considering the awful weather we experienced in February it is a wonder that any invertebrates were found!



Bits'n'Pieces

Rock Pools

Beside the obvious interest in the Teacher Workshops at the rock pools there has been a steady run of requests for assistance with visits to the seashore. Although it was not possible to accept all the invitations I was able to join Ngaere, Mokoia, Devon Intermediate, Mangorei and the Central Home Schoolers on their field trips.

Mokoia School

Both classrooms from Mokoia School visited the rock pools at Manihi Road last term. Their study centred around a comparison of the creatures found at different tidal zones. The children were amazed at the range of creatures found. Their attention to protecting the habitat by ensuring all the rocks were returned to their original place was very heartening.

Central Taranaki Home Schoolers

During the first term I have had the opportunity to work with this small group of children and their parents. Together we have visited the Dawson Falls area where we looked at the visible lava flows that formed Wilkie's Pools. We also visited the rock pools at Manihi Road where they had an interesting time discovering the creatures in this habitat.



Answers from page 3:

Secret code: 1. A footpath 2. A postage stamp
3. Their horns do not work.

Spiral word find: Electricity

Target word: Rotorangi

Crossword:

Across: 2-water, 3-nutrient, 9-temperature, 10-hypolimnion
Down: 1-sediment, 4-lake, 5-depth, 6-sample, 7-quality, 8-weeds.

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TARANAKI REGIONAL COUNCIL
NEWSLETTER TO SCHOOLS

The year has got away to a flying start again with a host of requests for assistance. While the majority of these have been to assist with field trips I am pleased to see that a number of schools are seeking support with long-term planning initiatives. An objective the Council has adopted was to shift the focus towards support for teaching programmes and away from 'the extra teacher on a field trip!' As schools become more involved with integrating Environmental Education into the curriculum this objective will assume a greater importance in time requirements.

A highlight of Seaweeek was to have been the presentation to schools by Jim Lilley, a marine protection expert from Canterbury. Unfortunately he suffered a sudden illness and was not able to travel to Taranaki. The substitute presenters accepted the challenge at short notice and did a great job in the promotion of our marine habitats. Thanks too for the schools that entered into the Mobile Madness activity at McDonald's Restaurant. The ceiling in the Restaurant looked a picture with the array of creative talents that produced the wonderful mobiles. The local Seaweeek co-ordinators are keen to slowly develop a wide range of activities to support you and your programmes that relate to this annual event.

Another highlight this year has been the Professional Development Programme. The first workshops focused on the rock pool habitat in conjunction with Seaweeek. The provision of two venues proved successful with 25 registrations for the Manihi Road session and 31 registrations for the New Plymouth session. Unfortunately the weather didn't co-operate (did we have any sunshine in February?) and both sessions were transferred to local schools. Comments received from participants still showed high satisfaction although the practical components were missing. The second workshop (The Outdoor Classroom) was held just prior to the end of term and attracted a great group of 16 keen and enthusiastic teachers (see report elsewhere).

Finally, keep up the good work! Please keep me informed of any environmental themes you are planning. The Council has a wealth of resource material and staff who may be of assistance.

Ka kite ano
Graeme



Schools in the Environment

No. 29

LAKE ROTORANGI

Since 1984 the Taranaki Regional Council has been involved in monitoring the water quality in Lake Rotorangi. The lake is the largest expanse of water in our region and it was expected that because of the nature of the lake there may be considerable problems with the water quality. At regular intervals

staff travel the length of the lake collecting samples for analysis.

This issue of SITE looks at the formation, history and monitoring programme undertaken on the lake.

The Outdoor Classroom

The final Teacher Development Workshop for the term was held at the Dawson Falls area on probably the clearest day we have had this year. A mix of 16 primary and secondary teachers participated in this workshop which examined a range of activities suitable for various age levels. The workshop was an ideal opportunity for the attendees to share their ideas with each other. Another positive outcome was for the teachers to meet the recently arrived Visitor Centre Manager, Abi Wightman, who showed us around the Centre and Konini Lodge. Lunch at the Dawson Falls Tourist Lodge was also a highlight!



Outdoor classroom participants examine the stream.

LAKE ROTORANGI

Lake Rotorangi is the largest lake in the Taranaki region. It was formed in 1984 as a reservoir for generating electricity for a company called Egmont Electricity.

The lake was formed by building an 80 m high earth wall dam near the end of Ball Road in South Taranaki. The dam created then filled the Patea River valley for a distance of about 46 kilometres to make the longest reservoir of its type in New Zealand. The lake is characterised by a winding, twisting course which varies in depth from about 50 m to less than 5 m near the top end. Lake Rotorangi has an average width of 130 m. Water levels vary over about 4 m during each operational year.

Why is the lake monitored?

The formation of a lake of this size leads to the establishment of a regionally significant recreational facility. As with all lakes the major issue for human use is centred around water quality. The consents that were granted to the lake developers had conditions attached that ensured the lake was closely monitored for water quality during its formation and over the consented period of 30 years.



How often is it monitored?

For the first three years the lake was monitored monthly. This was designed to keep an eye on water quality and to observe how the water reacted to the decay of vegetation which became submerged as the lake filled.

Four samples a year are now taken on the lake from three set sites along the lake's length. The programme is designed to take samples at significant times in the lake's character. As monitoring is dependent on weather and seasonal conditions the surveys are undertaken on or as near to: -

- 20 October** spring conditions before the lake develops water layers
- 20 February** summer conditions when layers are stable
- 20 March** late summer conditions before the lake water overturns
- 20 June** winter conditions after the water has overturned.

What is measured during monitoring?

The water quality items measured at the three sampling sites are: -

Parameter	Site 1	Site 2	Site 3
Dissolved oxygen	x	x	x
Temperature	x	x	x
Suspended solids	x	x	x
Total phosphorus	x	x	x
Dissolved reactive phosphorus	x	x	x
Nitrate-nitrogen	x	x	x
Nitrite-nitrogen	x	x	x
Ammoniacal-nitrogen	x	x	x
Total Kjeldahl nitrogen	x	x	x
Chlorophyll-a	x	x	x
Secchi disc transparency	x	x	x
pH	x	x	x
Conductivity	x	x	x

What effect do seasonal temperatures have?

During the summer months the water in lakes forms into layers (stratifies) with warm water on top and cooler water below. The layers form because the surface water is warmed by the sun and floats on the colder and denser water below. In a stratified lake the layers are separated by a zone of distinct rapid temperature change. The water of warmer temperature (nearer the surface) is called the epilimnion while the cooler water (nearer the bottom) is called the hypolimnion. The two layers are separated by the zone of rapid change known as the thermocline.



When lake temperatures and therefore density are uniform, the wind and surface waves cause the water to be well mixed. When the epilimnion and hypolimnion mix in this way it is known as 'overturn'.

What changes have occurred?

Since the formation of the lake the most dramatic change has been related to depth in the upper reaches of the lake which may have decreased by four or 5 metres in maximum depth. The gradual filling of lake beds is a natural process but may be more rapid in a lake formed by damming a river. A sedimentation survey will be repeated within the next two years.

Because Lake Rotorangi is situated in a farming catchment and vegetation was submerged by the lake it was anticipated that significant changes in the levels of nutrients in the lake might occur. These nutrients are washed into the lake from surrounding land used for agricultural production and occur naturally as vegetation decomposes in the lake water. The monitoring programme has shown that Lake Rotorangi has remained in a mesotrophic state since its formation.

The trophic levels and their meaning are: -

- Oligotrophic** low nutrient levels
- Mesotrophic** moderate nutrient levels
- Eutrophic** high nutrient levels
- Hypertrophic** very high nutrient levels



Who uses the lake?

Naturally enough, the prime use of the water in the lake is for the production of electricity. Other users since the formation of the lake have been the 'houseboat' tourists. Small motors enable the hirer to travel up and down the lake in a leisurely manner and appreciate the quiet meandering nature of the lake and the impressive reflections in its still waters.

Recreational fishermen have continued to make use of the lake. While the trout numbers have not increased significantly trout are still present in small numbers. More regular catches of perch have been reported.

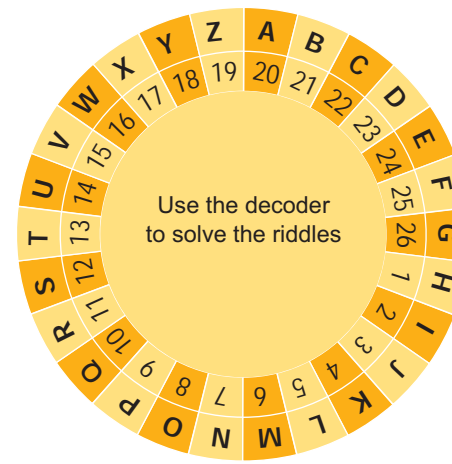
Two sites on the lake have been designated for water skiing and during the summer months this accounts for the most significant recreational use.

As Lake Rotorangi provides eels with a path to and from the upper reaches of the Patea River catchment it is used extensively by eel fishermen.

The other users are kayakers or canoeists.

Junior Environmentalists Page

Secret code



1. What wears shoes but does not walk?

20 | 25 | 8 | 8 | 13 | 9 | 20 | 13 | 1

2. What travels around the world but stays in a corner?

20 | 9 | 8 | 12 | 13 | 20 | 26 | 24 | 12 | 13 | 20 | 6 | 9

3. Why do cows have bells?

13 | 1 | 24 | 2 | 11 | 1 | 8 | 11 | 7 | 12 | 23 | 8

7 | 8 | 13 | 16 | 8 | 11 | 4

Target word

How many words of 4 or more letters can you make from the grid below? Each word must contain the centre letter. You must get one nine-letter word.

O	G	R
N	R	T
O	I	A

Goal:

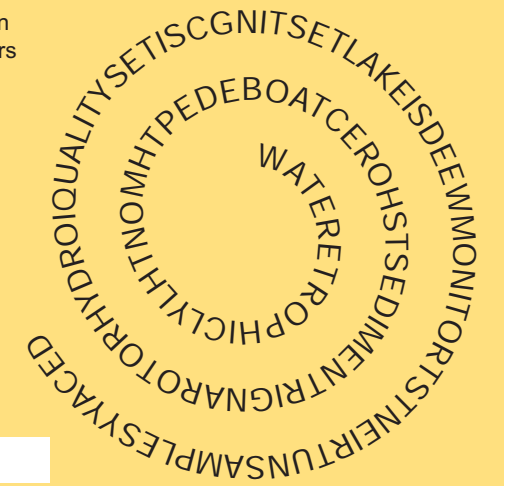
- 1-10 Good
- 11-20 Great
- 21+ Excellent

Spiral word find

Find the listed words in the spiral. They can be forward or backward. The left over letters will name something produced from Lake Rotorangi.

- | | | |
|-----------|---------|-----------|
| quality | shore | nutrients |
| trophic | depth | testing |
| monthly | hydro | decay |
| samples | weeds | sediment |
| sites | lake | |
| water | monitor | |
| Rotorangi | boat | |

Mystery Word



Crossword

Across

2. Our bodies are made up mostly of this.
3. The main culprit in water quality change.
9. A thermometer measures this.
10. Scientific name for the cold water near the bottom of the lake.
5. Distance from surface to bottom of lake.
6. Technical name for the material collected for analysis.
7. Water needs to be of the highest _____.
8. Plants that are not wanted.

Down

1. Name for dirt and small grains of soil.
4. Name for a large body of water.

