



WATER AT PEKAPEKA

Introduction

The suggested aim of this section is for students to learn and understand the importance of water quality and the environmental conditions that effect it. Students will have the opportunity to study, observe and test water quality in and around Pekapeka.

This resource provides information about water quality and contributors, water levels and controls, as well as a list of books and websites suitable for students to further their knowledge of these, and other water topics.

Activity sheets can be manipulated and adjusted to suit the intended learning outcomes and photographs can be used as teacher aids or included in classroom activities, powerpoints and for other curricular activities.

The following activities are based on 'pre-visit', 'on site' and 'post visit' categories and can be chosen according to ages, levels, interests or needs.



700 WATER Water quality

Wetlands play an important role in improving water quality. Wetlands absorb water like a sponge as it flows through it. They also act like a filter to make the water cleaner before releasing it again. Dirty water in - clean water out! Pekapeka gets its water from Lake Poukawa (ground water) and surface water runoff from the surrounding hills.

Water flow rates
Water flows very slowly in wetlands which means particles settle to the bottom making the water clearer. Vegetation like Raupo that grows in the wetland helps to slow down the water flow.

Cleaning the water
Wetland plants such as harakeke and raupo help to remove nutrients in the water such as excess nitrogen and phosphorus. They also provide shade that cools the water temperature down to prevent algae blooms.

Threats to water quality
The main threats to water quality are caused through draining the wetlands, clearing vegetation and grazing stock. Increased nutrients in the water come from animals, pollution and fertiliser runoff from the surrounding hills. These increased nutrients cause algae and decrease oxygen levels in the water.

Wetlands are like kidneys, they clean the water as it flows through them

STUDENT INFORMATION SHEETS

A set of Student Information Sheets have been prepared covering basic information on the main birds present at Pekapeka wetland. This list is by no means exhaustive and we encourage additional research through the provided links and information sources listed on the following pages.

- INFO700 Water quality
- INFO701 Water levels & weirs
- INFO702 Fish passage
- INFO504 Mud Snail
- INFO505 Waterboatmen

504 MUD SNAIL Potamopyrgus Antipodorum

The New Zealand mud snail is a species of very small freshwater snail with a gel and an operculum (lid) that stops the snail from drying out during low flow and periods of drought. They thrive in disturbed waterways and benefit from high nutrient levels in water that creates more algae to feed from.

Description
The shell of the Mud Snail is extended with 7 or 8 whorls with deep grooves. Shell covers vary from grey to dark brown and light brown. The average size is only around 5 mm however they can grow up to 12mm.

Food
They are opportunistic grazers feeding on plant and animal material and algae. Mud snails can also scrape the guts of fish and birds and may be transported in their droppings.

Reproduction
They can reproduce without fertilisation because females lay eggs that develop into young.

702 WATER Fish Passage

Many native fish migrate back to the same stream they parents came from when they are young. If the streams are badly modified, many of the fish up to a suitable habitat. It's important that streams and rivers are managed in good ways with fish passage or similar structures.

The best fish passage weirs, built in the 1950s, consisted of a frame of logs.

The weir guides water down the weir and creates small pockets of still water so the fish can rest.

What make
• Wet logs off from one side
• A series of rest along the weir
• Natural weirs

What make
• Weir walls
• Small cut water flow
• Low water
• No barrier pools for fish

701 WATER Water levels and weirs

There are several water testing sites at Pekapeka that are used to measure the water levels, flow rate and water quality. To ensure the wetland works it needs to be at a certain water level. This ensures that water always moves slowly throughout the wetland and does not dry out.

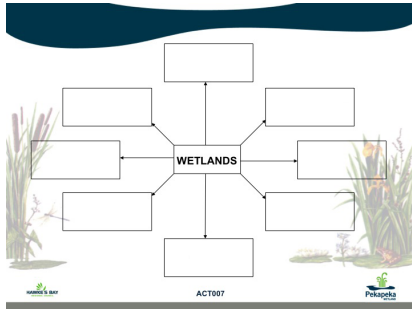
Over many years the water level at Pekapeka has been reduced due to a number of factors including:
• Farms using water from Lake Poukawa for irrigation purposes
• Willow trees (before they were removed) absorbing a large amount of water to live and grow
• Native vegetation which absorbs water during floods and slowly releases it during droughts (not designed for animal grazing)
The result that Pekapeka had highly fluctuating water levels and the wetland could not work properly. Due to the lack of native vegetation, biodiversity was not and the water quality was also reduced.

To control the water level at Pekapeka a number of things were done including:
• Willow removal
• Building weirs that control the input and output of water
• Re-vegetating the wetland and preventing it from grazing

With no water table control Pekapeka would dry up every 2-3 years.



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PRE-VISIT ACTIVITIES

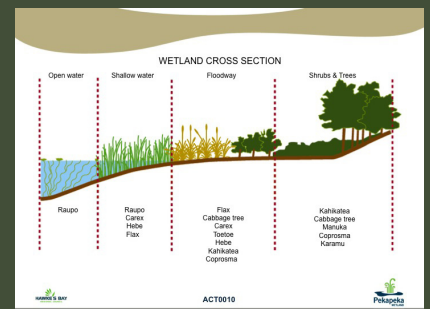
- Have a discussion about water quality – why is it important to us? Is it important to wildlife? What affects water quality?
- Investigate the different water sampling devices available and choose and make your own device.
- Look at water samples from around the school. Analyse the pH and dissolved oxygen. (Contact a facilitator from National Waterways to help).
- Learn how a wetland filters and cleans water.
- Use Activity Sheets ACT007, ACT008, ACT010.

FIELD DAY ACTIVITIES

- While at Pekapeka, make a list of words to describe the water.
- Have a look around Pekapeka and take note of all the things that increase and decrease water quality. Make sketches of each of these things.
- Take water samples from Pekapeka.
- Use Activity Sheets ACT007, ACT012.

POST-VISIT ACTIVITIES

- Make a poster about water quality. Use the sketches you made on your site visit as a starting point. Are any present at your school? Is there any thing that can be done to help or ways to teach people about it.
- Analyse the water sample taken at Pekapeka by testing its pH and dissolved oxygen levels. (Contact a facilitator from National Waterways to help).
- Make comparisons with the water samples taken from around the school. Make graphs showing the results. (Remember to compare the surrounding environments as well).
- Use Activity Sheet ACT009.





Additional Resources

BOOKS

Water Quality

By Michael Pelusey
Pub Macmillan Library 2006
ISBN: 978-1-42020-311-0

This book explains the water cycle and how vital it is to look after our water resources, how important it is to keep our water clean and safe to drink.

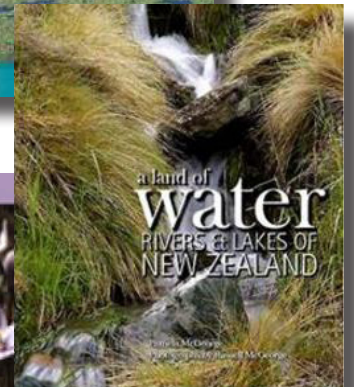
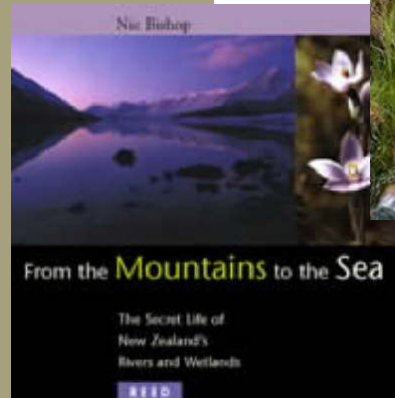
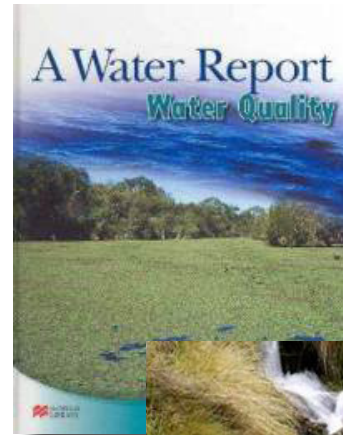
A Land of Water : Rivers and Lakes of New Zealand

By Pamela McGeorge
Photographs by Russell McGeorge.
Pub David Bateman 2007
ISBN: 978-1-86953-616-9

This book tells the story of our waterways and of our enduring relationships with this marvellous life-giving resource. Along the way McGeorge retells Māori legends and stories of the past.

From the Mountains to the Sea

By Nic Bishop
Reed Books 1994
Birkenhead, Auckland
ISBN: 0790003473 9780790003474
The secret life of New Zealand's rivers and wetlands



WEBSITES

- www.teara.govt.nz
- www.doc.govt.nz
- www.hbrc.govt.nz
- www.fishandgame.org.nz
- www.cawthron.org.nz
- www.niwa.co.nz
- www.wikipedia.org
- www.sciencekids.co.nz/water
- www.sciencelearn.org.nz
- www.seakeepers-nz.com

OTHER INFORMATION SOURCES

School Journals:

Level CN No.3, 2004. Wonderful Water, story by Philippa Werry. Many local authorities run projects in which students take direct action in monitoring and protecting local ecosystems.

Level CN No.2, 1998. Testing the North River, article by Elizabeth McCabe. A group of children and adults spend a day doing scientific tests on the water of the North River. The tests for colour, smell, suspended solids, turbidity, and velocity are described and can be reproduced at any appropriate site.

Water testing kit available to loan from Hawkes Bay Regional Council



IMG700



IMG701



IMG702



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IMG705



IMG510



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