



# WETLANDS

ISSUE 47 - JULY 2011



**Tena koutou ngā hoa!** Hello pollution busters!

We hope that you are using the tips and tricks from the April newsletter to keep our air clean and keep yourself warm on these cool winters nights!

In this issue we will be learning all about WETLANDS! When you think of wetlands you might think of wet, boggy, stinky, mucky places. But as you will see there are many different types of wetlands and they do all sorts of great things that help improve the quality of our water.

Thanks to those of you who entered our colouring competition in our April issue - see some of the great entries on page 11 along with our competition to find the secret sentence hidden in the wordfind.

BuzzBOP and the team hope you have a really good holiday break and remember to send us your stories and photos. We would love to hear from you about what you would like to see in our newsletter.

"Kia u, kia ngākaunui ki ngā mahi pai". Be steadfast and conscientious in all your good work.

From BuzzBOP and the team at Bay of Plenty Regional Council.



## Glossary

**Bacteria** – A very tiny living thing.

**Diverse** – Many and different.

**Ecosystem** – A community of living things, together with their environment.

**Endangered** – Nearly extinct.

**Endemic** – Found naturally only in New Zealand.

**Filter** – Something that lets the water through but stops the sediment.

**Habitat** – A place where a plant or animal normally grows or lives.

**Migratory** – Birds that move from place to place.

**Nutrients** – A food source.

**Peat** – Wet spongy ground of decomposing vegetation.

**Purify** – To make clean.

**Reduce** – Make something smaller/less.

**Sediment** – Solid material (like tiny pieces of rock, soil and plants) that fall to the bottom of a liquid.

# WHAT IS A WETLAND?

## A wetland is exactly that - wet land!

It is anywhere the soil is soaked or covered with water all of the time (a permanent wetland) or some of the time (an ephemeral wetland) and supports a natural ecosystem of plants and animals that have adapted to wetland living. It can be fresh water, like water from a river/stream, salt water from the sea, or a mixture of both.

Wetlands can be very big or as small as a pond. They can be natural or human-made, wet all of the time or only some of the time. Wetlands are some of New Zealand's most diverse habitats. They are home to some amazing plants and animals and many aren't found anywhere else in the world! The plants and animals that make their home in wetlands like living in wet places. Not all animals can live in wetlands!

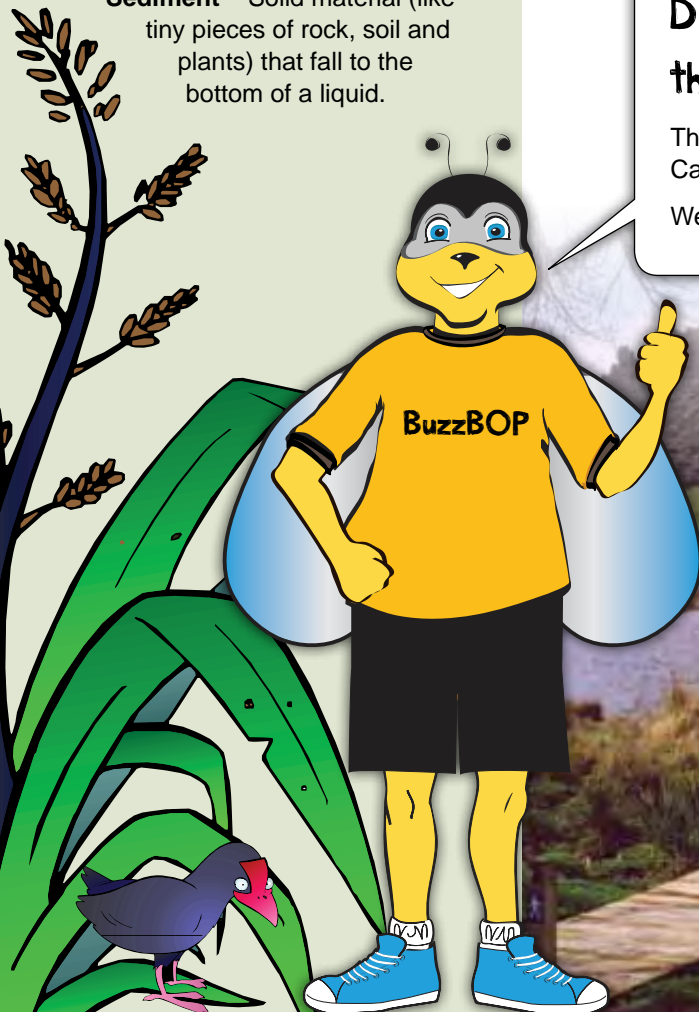
Wetlands are great places where you can fish, kayak and watch birds and other wetland creatures.

They also differ in how fertile (or rich in plant food) they are:

- Oligotrophic has low level of nutrients.
- Mesotrophic has a medium level of nutrients.
- Eutrophic has a high level of nutrients.

## Did you know wetlands make up 6 percent of the earth's surface?

They are found all around the world except Antarctica.  
Can you think of a reason why there are no wetlands in Antarctica?  
Wetlands make up 2 percent of New Zealand's land area.



This wetland is at Lake Ōkāreka - It has a cool walkway through it!

# WHAT DO WETLANDS DO?

Wetlands are a very important ecosystem. They do some important jobs:

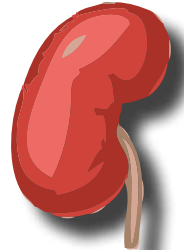
## Help stop flooding - Wetlands are like giant sponges.

They store flood water, and slow down how fast it flows into streams and rivers. In dry weather the water in the wetland flows out and stops streams from drying out.



## Purify water - We have a kidney and the land has a wetland!

Wetlands and kidneys both cleanse the system. Wetlands filter out sediment and nutrients that are washed off the land. The plants growing in wetlands clean out some pollution and add oxygen to the water.



## Remove sediment

Wetlands reduce the amount of sediment that flows directly into rivers, lakes and harbours where it can harm the habitat for plants, invertebrates (like insects and worms) and fish.

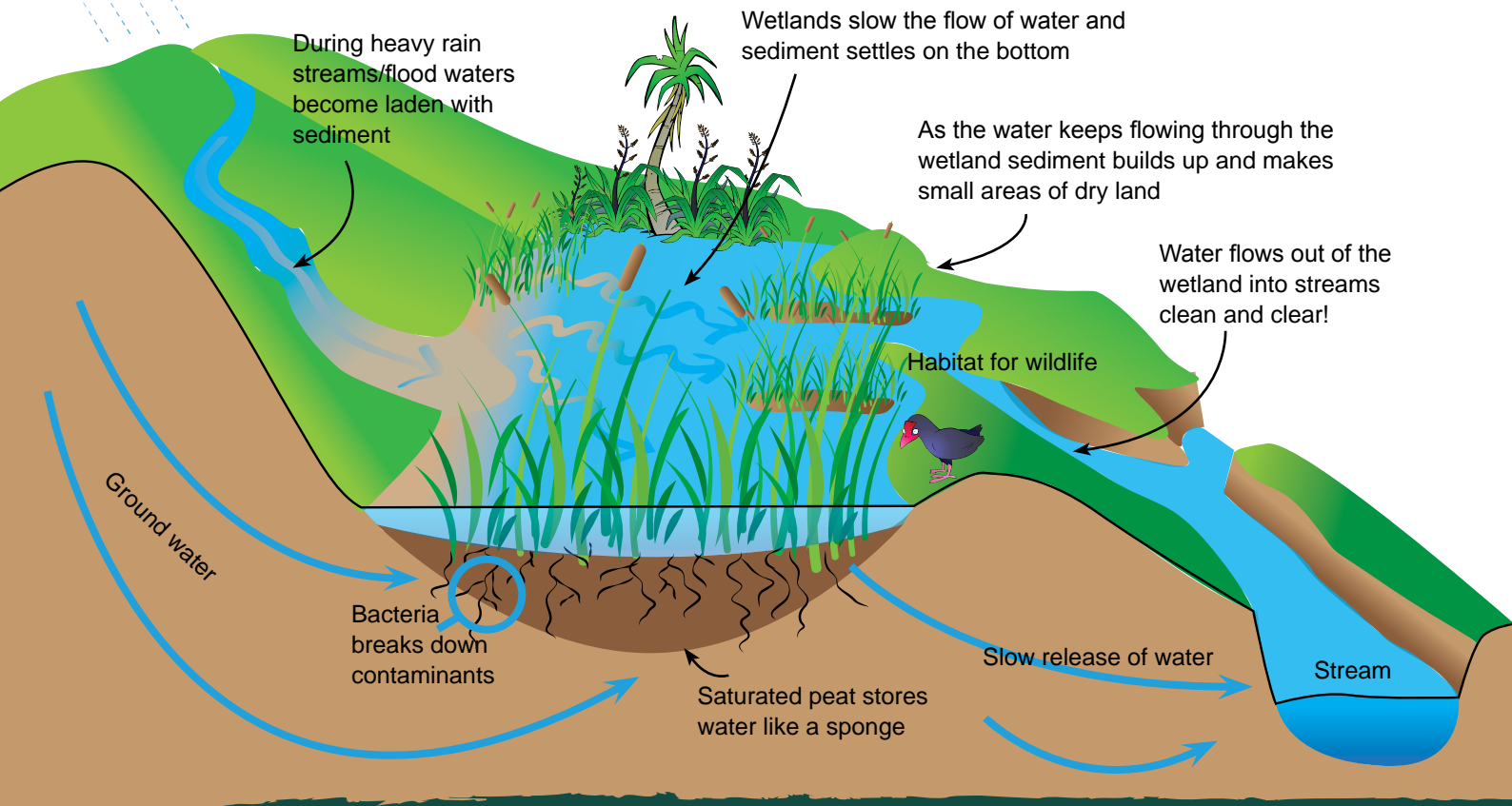
## Stop erosion

The roots of wetland plants hold streams and riverbanks together. The plants help stop the banks from washing away with the flowing water.

## Home for many plants and animals

Wetlands provide a home (habitat) for some rare and endemic (native to New Zealand) plants and animals. They also provide food for migratory and local birds.

# HOW DO WETLANDS WORK?



# TYPES OF WETLANDS

The main groups of wetlands are:

**Palustrine** – These are made by ground water, surface water or rain, and include freshwater swamps, marshes and bogs. The plants that you usually find in swamps are: harakeke (flax), ti kouka (cabbage trees), sedges and rushes, scrub and some forest trees.

**Lacustrine** – These are on the edge of lakes and ponds. The plants you usually find in these wetlands are: low plants, like mosses, cushion plants or sedges. Many of these wetlands can be found around the Rotorua lakes.

**Riverine** – Are on the edges of rivers and streams where they flood.

**Estuarine** – Are where fresh and saltwater mix (because sea water comes into them).

**Floating** – Are human-made wetlands that float! We are going to learn more about these on page 6.

## Most of the wetlands in the Bay of Plenty are swamps.

So... what's the difference between a swamp, marsh and bog?

**Swamps** usually have trees growing out of the wet silty soil and are normally found along flood plains, around rivers or basins with poor drainage.

**Marshes** are tree-less wetlands. They have lots of grasses and reeds and are usually in still water around lakes, ponds and rivers.

**Bogs** are peatlands which get their water supply only from rain. They are poorly drained, and the water doesn't move very much. They are usually on level or very gently sloping ground. They commonly have mosses, lichens, cushion plants, sedges and grasses.

## Filtering activity

Find a sloping piece of ground. Pretend that at the bottom of the slope is a beautiful stream.

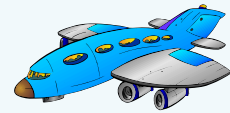
**You will need:**

- 2 Jars
- Some small stones, grass, seeds etc
- Water
- A sponge

**What to do:**

1. Fill the jars with water.
2. Add some of the stones, grass and seeds into the jars.
3. Pour one jar down the slope. Where do all the bits and pieces end up?
4. Now put a sponge halfway down the slope and tip the second jar down the slope.
5. What happens to the water?
6. What happens to the bits and pieces?





# PEOPLE AND WETLANDS

There are hundreds of wetlands in the Bay of Plenty. There used to be many, many more but people wanted to use the land for other things. They drained the water out of a lot of the wetlands and cleared the native plants that lived in them so that they could use the land for farms, towns and even some airports are on drained wetlands.

In New Zealand we have less than 10 percent of our original wetlands. Without the water and plants, the native birds, fish and other creatures lost their habitat. Some of these plants, fish and birds have now gone forever or are very rare or endangered.

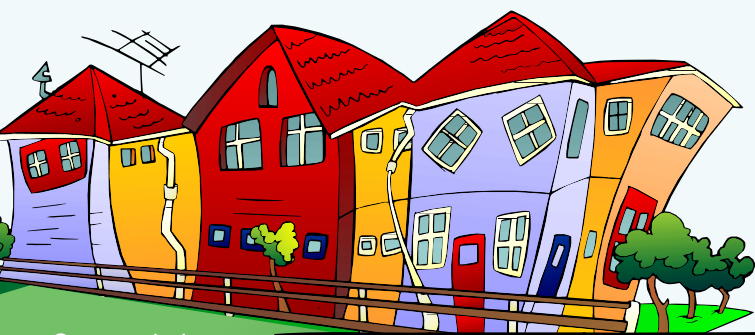
The wetlands that are left need our help. Too many nutrients and sediments from towns and farms are harming the wetlands. Pest animals like cats and stoats harm birds in the wetlands. Pest plants like blackberry grow over and kill native plants. Stock like cows and sheep disturb wetlands and eat the plants.

Even if a wetland has been damaged, it can recover quickly. This means that wetlands are very resilient ecosystems.

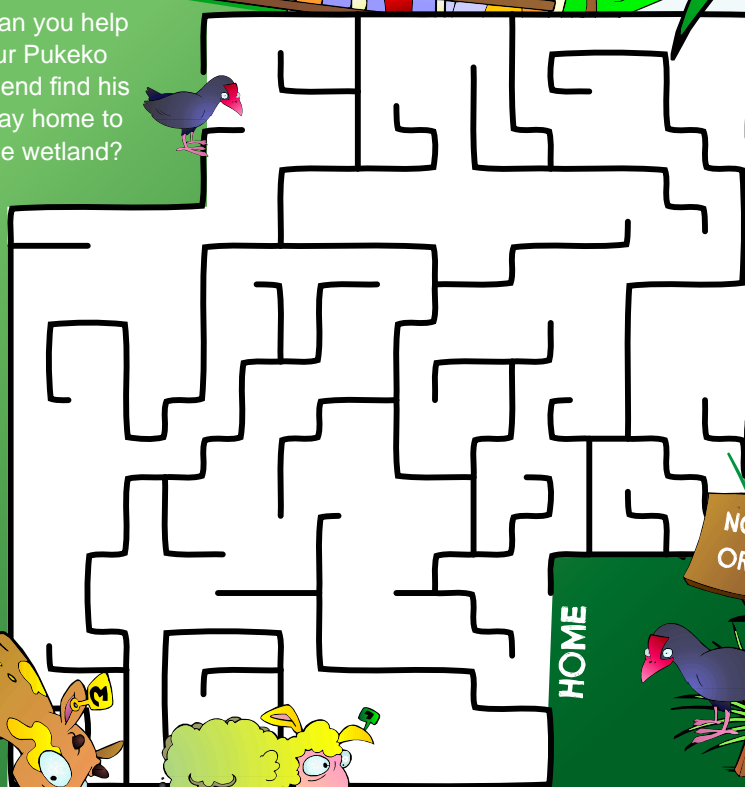
(Resilient means able to get better quickly – are you resilient? Do you get better from a cold quickly?)

## What can you do to help?

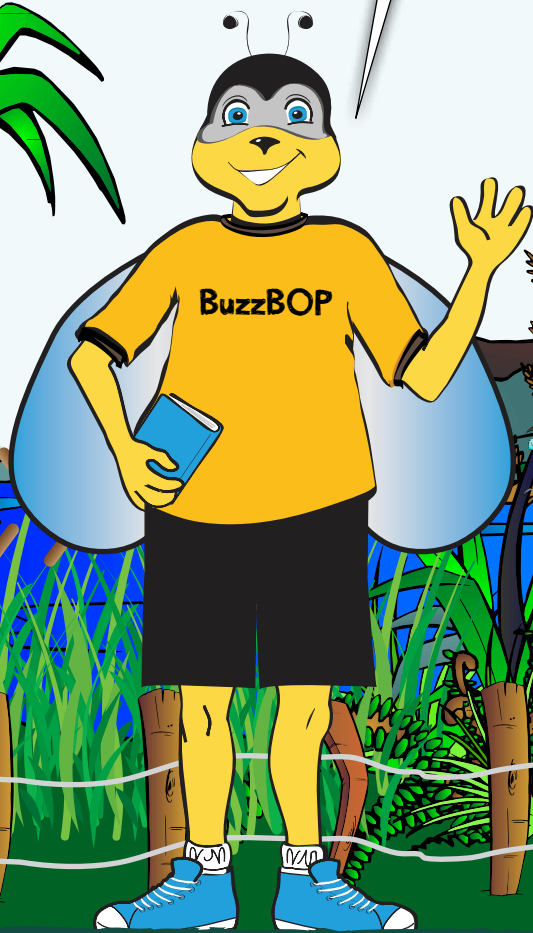
- The most important thing to do is to keep water flowing into wetlands!
- If you have a wetland on your land, ask for it to be fenced off to stop cows and sheep from getting into it. Tell mum or dad that your district, city or regional council might be able to help you with this.
- Plant natives in the wetland area and get rid of weeds.
- Be careful not to disturb the plants and animals when walking and playing in a wetland.
- Wash the car on the grass to stop the soap flowing into the waterways and wetlands.
- Join a Care Group and help clean up and restore a wetland in your area.



Can you help our Pukeko friend find his way home to the wetland?



NO SHEEP OR COWS



# FLOATING WETLANDS

## What is a floating wetland?

A floating wetland is a floating mat with wetland plants growing on it. Floating wetlands are quite new. You may have seen them on Lake Rotoiti or Lake Rotoehu.

There are two small wetlands on Lake Rotoehu at Ōtautū Bay. Whangamarino school and Taheke Marae launched two small wetlands in May last year on Lake Rotoiti. Check out the huge floating wetland that Te Kura Kaupapa Māori o Rotoiti worked on (when you go past Lake Rotoiti stop and have a look it is in the lake just across the road from the Kura).

Floating wetlands are being set up in other parts of the world as water quality filters. In Singapore walkways have been set up on a river surrounded by floating wetlands (and this wetland was made by the same company that made the floating wetlands on our lakes)!

Floating wetlands can help filter out pollution, and create wildlife habitat. They are simple, don't cost that much to make and are going to help to bring back the water quality of our lakes!

*Plants grow on the floating island by absorbing nutrients from the water, they also provide a habitat for birds*

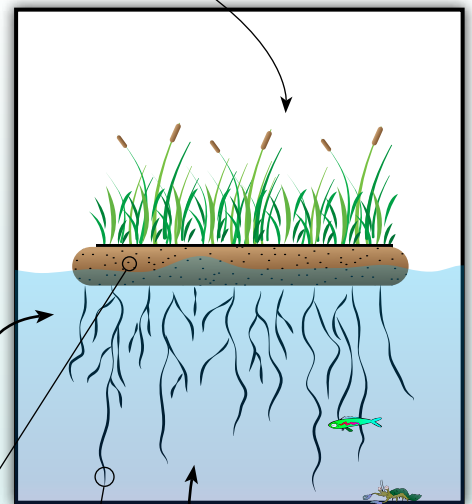
## How do they work?

The floating wetland is an exciting tool to help water quality. The plants remove contaminants (bad stuff) by using micro-organisms on the plant roots to purify (clean) the water.

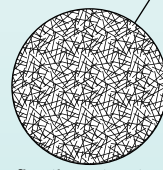
Floating wetlands also provide shade, shelter and food for animals, insects and fish. They fit with the habitat around them (they look like they might belong there naturally). They also provide a place for birds and fish to nest and breed, while improving water quality by absorbing nutrients!

They have more opportunity to absorb nutrients than shore plants because they can be positioned and anchored anywhere in the lake!

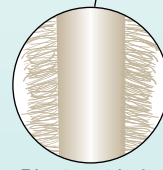
*Because the islands float they can work in any water depth!*



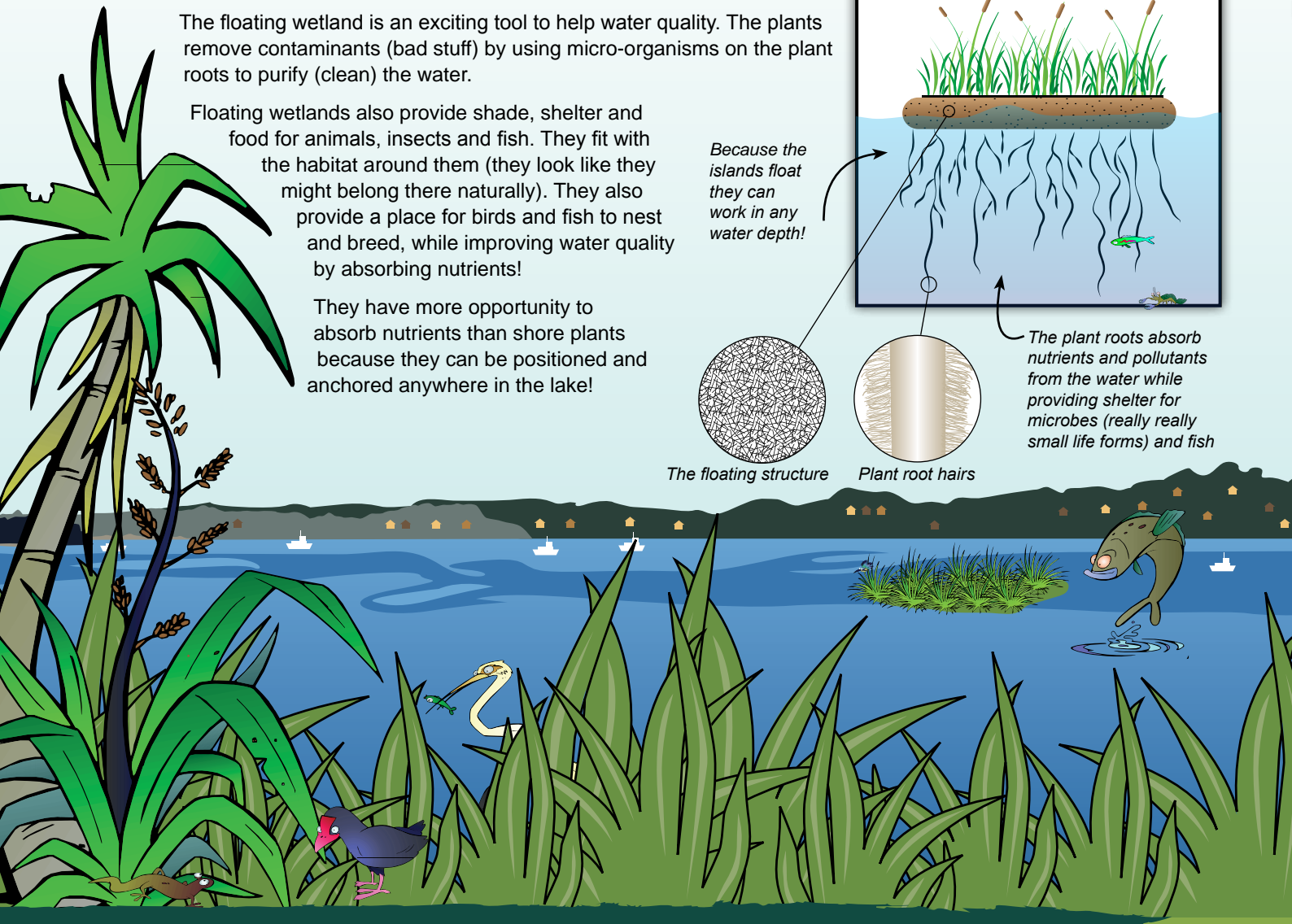
*The plant roots absorb nutrients and pollutants from the water while providing shelter for microbes (really really small life forms) and fish*



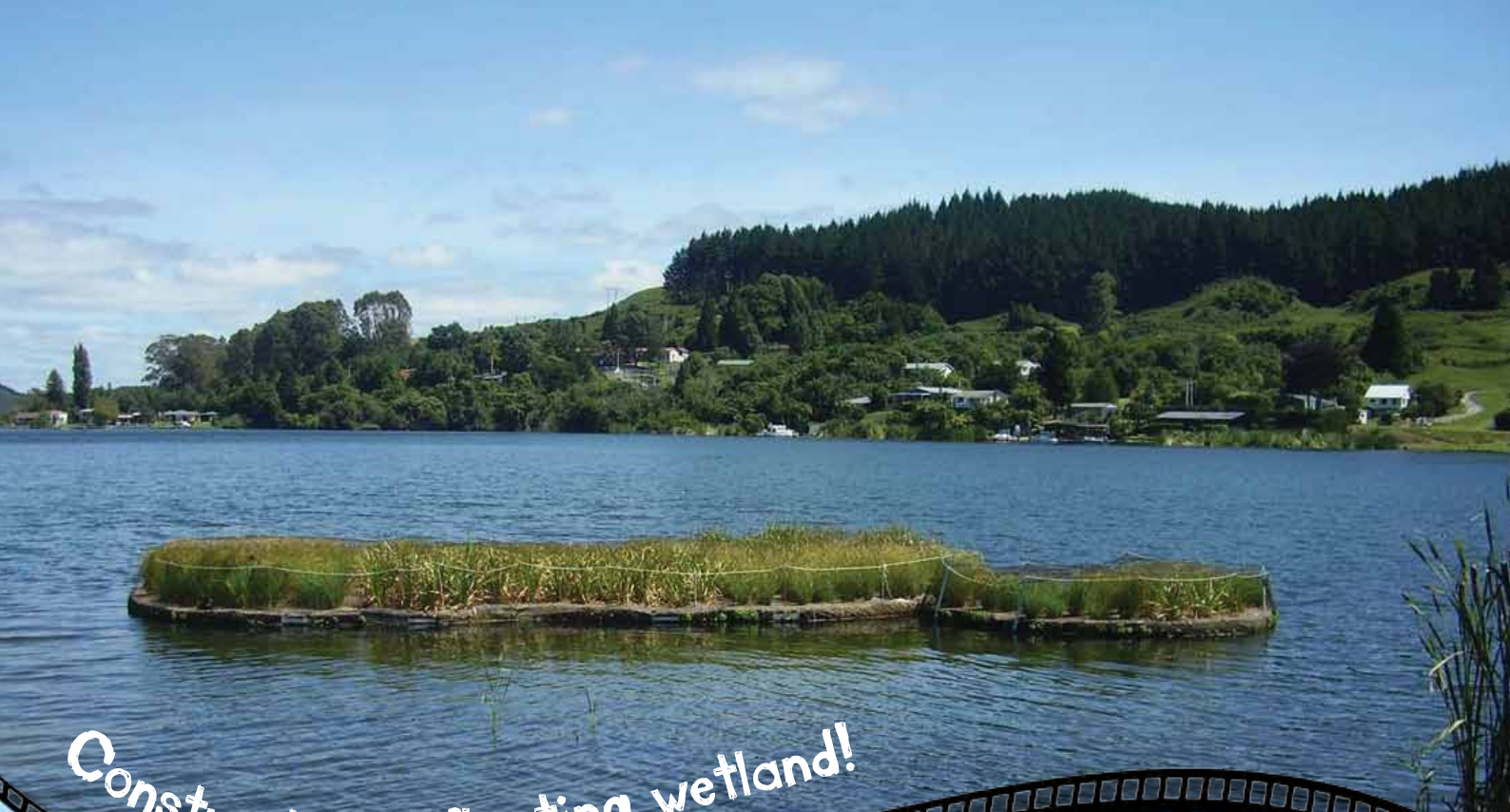
The floating structure



Plant root hairs







# Constructing a floating wetland!



Photos: Te Kura Kaupapa Māori o Rotoiti constructing the floating wetland in Lake Rotoiti

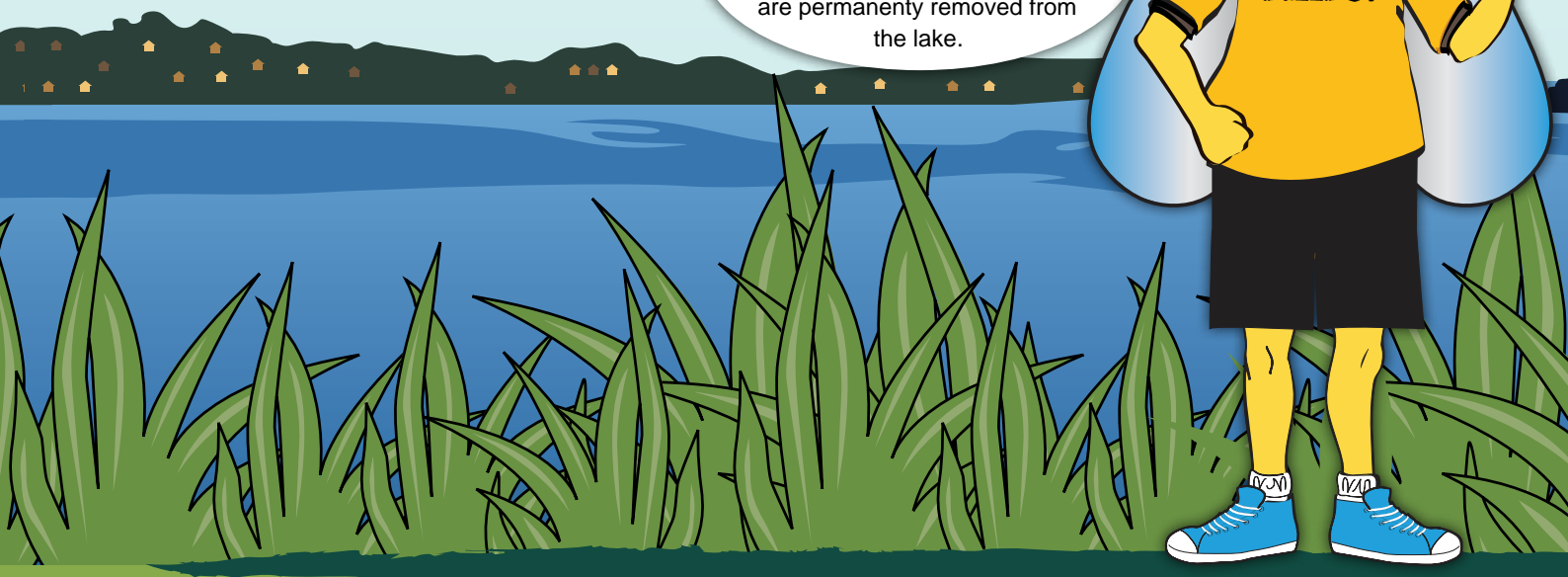
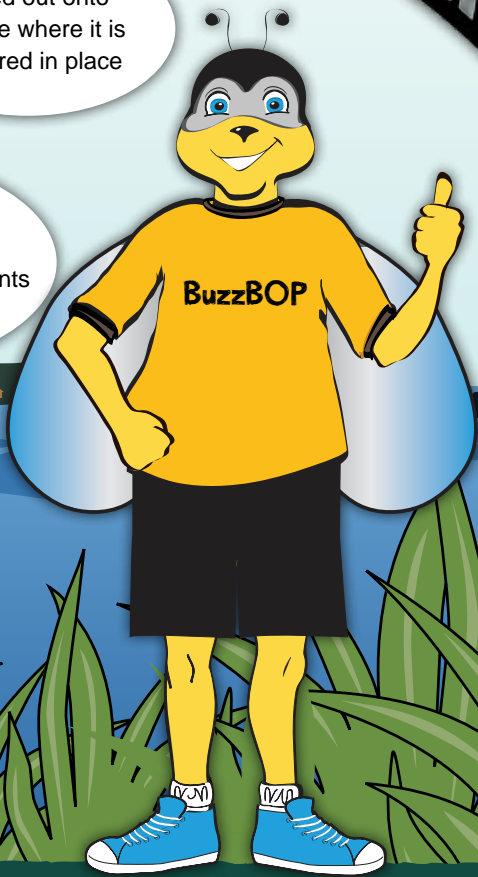
Sections of wetland (which are made of recycled plastic bottles) are transported to shore ready for construction.

Put together like a big puzzle on shore.

Planted with native plants

Towed out onto the lake where it is anchored in place

Islands can be taken in to shore to "harvest" vegetation for composting, that way some nutrients are permanently removed from the lake.



# PLANTS

Wetland plants have become used to having wet feet! Plants that grow in a wetland are called hydrophytes, which means water lovers. This means they like growing in wet places. Some of these plants can also grow in dry places as well. But many have the special ability to grow in waterlogged soils of poor quality.

The different plants live in different communities. These communities are worked out by the level of water that they grow in.

In lakes and ponds the four communities/zones are:

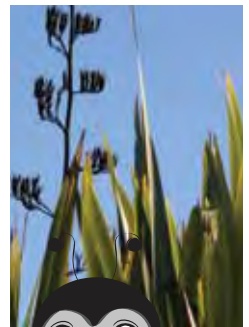
**Submerged** - plants growing under the water.

**Floating** - plants with leaves that float on the water.

**Emergent** - plants with their roots in shallow water but with stems and leaves exposed.

**Shoreline** - plants growing on dry land but near the water's edge like kahikatea, harakeke, manuka.

## Can you match the english and māori names to the plant pictures?



Harakeke

Cutty Grass

Toe Toe

Raupō

Manuka

Bulrush

Tea Tree

Flax

Cabbage Tree

Ti Kōuka



Answers - Photos left to right: Raupō = Bulrush, Ti Kōuka = Cabbage Tree, Manuka = Tea Tree, Toe Toe = Cutty Grass, Harakeke = Flax

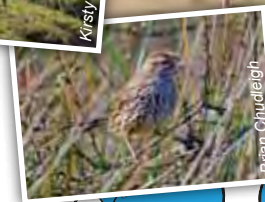
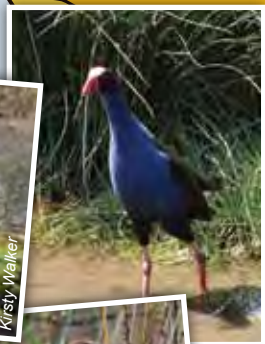
# BIRDS

In New Zealand wetlands make up less than 2 percent of our land area, but 22 percent of our bird species have wetlands as their main habitat (where they live). Many more birds use wetlands as a secondary habitat. So a lot of our birds prefer to live in wetlands and even more like going to a wetland for food or sometimes as use it as a second home.

Birds use a variety of habitats within wetlands. Some prefer open water, others like the bushes around the edge or shallow water.

Common wetland birds are pukeko, herons, shags, fernbirds and ducks.

Next time you visit a wetland count how many different bird species you see.





# FISH

Wetlands are also very important places for native fish. At least 27 different types can be found in wetlands! One of the most common is **whitebait** - if you look at a handful of whitebait, you might think the little fish are all the same kind. They might look the same, but they are really the young fish of five different types of fish – inanga, koaro, banded kokopu, giant kokopu and shortjaw kokopu.

Did you know that Longfin and Shortfin eels are also found in wetlands! The shortfin eel is most common in lowland and coastal sites. Longfin eels travel further inland.

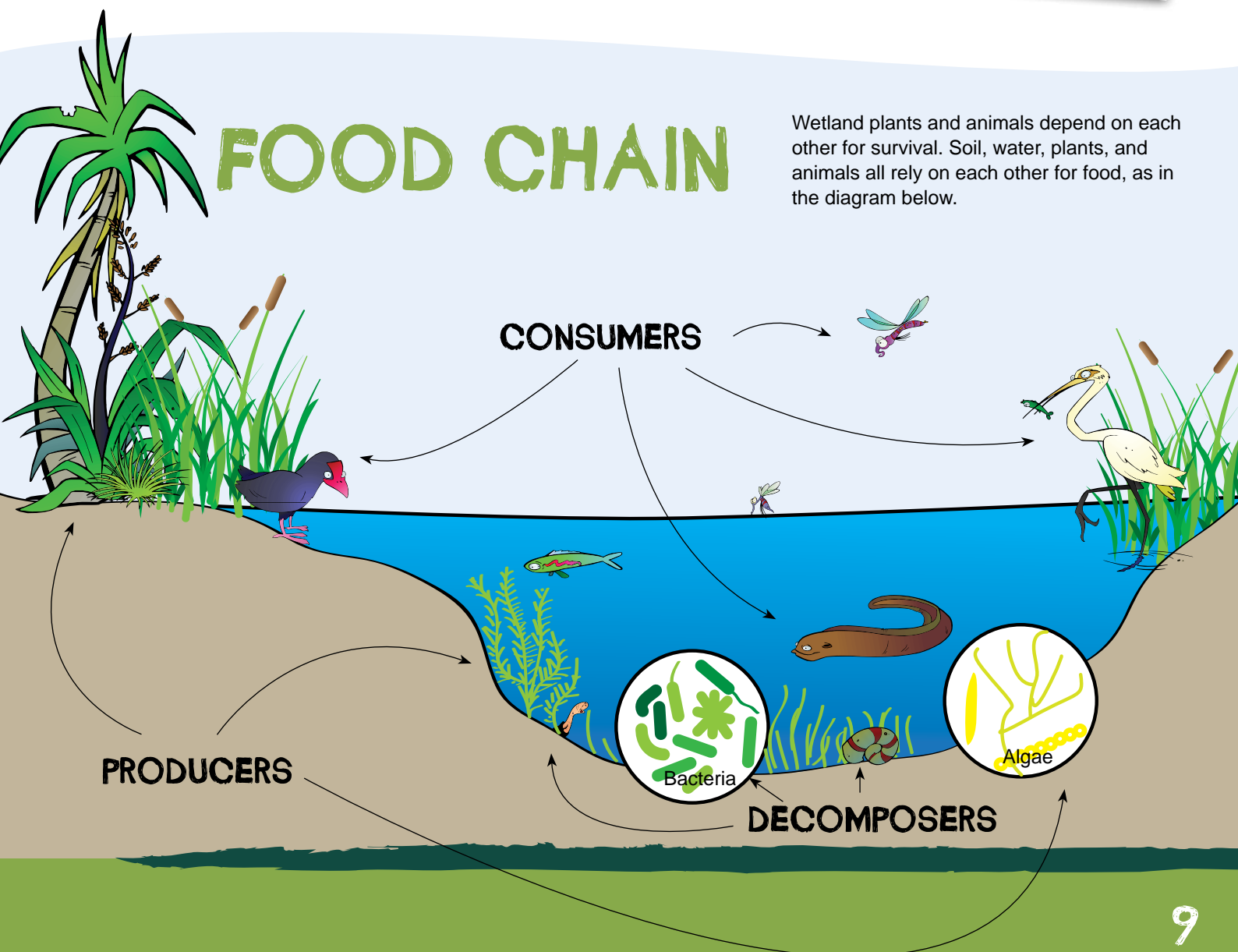
# INVERTEBRATES

An invertebrate is an animal that does not have a backbone or skeleton inside its body like insects, spiders and worms. Common invertebrates in wetlands are stonefly, mayfly and damselfly. All the insects around the wetland provide food for the fish and birds there.



# FOOD CHAIN

Wetland plants and animals depend on each other for survival. Soil, water, plants, and animals all rely on each other for food, as in the diagram below.



# MĀORI AND WETLANDS

Māori have strong cultural and traditional links with wetlands. These taonga (treasures) are spiritually significant. Māori are concerned about the damming, drainage and pollution of waterways because of their effects on the mauri (life force) of the waterways.

Water is the life-giver, it represents the blood of Papatuanuku, the Earth Mother, and the tears of Ranginui, the Sky Father. Waterways are home to many taniwha (spiritual beings) that look after the people and ensure their physical and spiritual protection.

Wetlands were a valuable kai (food) supply. Raupō roots could be eaten and the pollen used to make a type of bread or porridge. Eels, fish, inanga (whitebait) and birds were also eaten.

Plants like harekeke (flax) could be made into clothing, mats, kete, kites and poi. They could be used to thatch the walls and roof of a whare and to help make rafts and waka. Rongoā (Medicine) could be made from wetland plants as well. Some special areas of wetland were also used to make a paru (mud dye) as well.



## Te Wai Tapu

The Māori Perception of the Water Cycle

Te Uhi Tapu o Papatuanuku  
(the sacred cloak of mother earth)

Tū-Kapua (Cloud)

TE IHO-RANGI  
(God of Rain)

Korohū  
(Evaporation)

Ngā Roimata  
Aroha a Ranginui  
(The sky father's  
tears of love)

Ua  
(Rain)

Papatuanuku (Mother Earth)

Te wai u o Papatuanuku  
(Life giving waters of mother earth)

PARAWHENUAMEA  
(Guardian of freshwater)





# APRIL'S COMPETITION WINNERS

Well done to all of you who entered our 'Help the air this winter' colouring competition.

Great effort age 0 – 6 **Halle Mollekin**, Great effort age 7 – 10 **Kyle Besseling**, Great effort age 11 + **Emily McCarthy**

The winners were...

**Winner age 0 – 6 Reece Thompson**



**Winner age 7 – 10 Courtney Beehre**



**Winner age 11 + Alvaretta Foster**



## COMPETITION TIME!

Can you discover the secret sentence hidden in this wordfind? When you have found all the Māori and English words there will be letters left over that will make up the secret sentence to fill the spaces in the bottom section. Send it in to win!

D N E H P M A W S C C B H O W  
 E R T N L I A K M A A A A P N  
 E X I D O K S E N B A S R U A  
 O A R B U R D O A B S K E A T  
 T L E O N I E E W A A E K R A  
 E F K A C R T H R G K T E O T  
 O I N I O A E G E E A D K E A  
 T L N R K G Y F F T W U E B M  
 L E L I A T N A F R I P W U K  
 E E H T T F O O D E T H A L O  
 P A U U E T E K R E E L W R T  
 K N C B U I L D I N G R A U U  
 A A K A W A K A W I P C A S K  
 W H I T E P I N E R E P O H U  
 O K E K U P E Y D D U M E S W

### MĀORI

TI KŌUKA  
 KETE  
 WHARE  
 WAKA  
 RAUPŌ  
 TOETOE  
 TUNA  
 PĪWAKAWAKA  
 MATATA  
 HAREKEKE  
 KAI  
 KAHIKATEA  
 RONGOĀ  
 KŌTUKU  
 REPO  
 PUKEKO  
 PARU

### ENGLISH

CABBAGE TREE  
 BASKET  
 BUILDING  
 CANOE  
 BULRUSH  
 CUTTY GRASS  
 EEL  
 FANTAIL  
 FERN BIRD  
 FLAX  
 FOOD  
 WHITE PINE  
 MEDICINE  
 WHITE HERON  
 SWAMP  
 SWAMP HEN  
 MUD DYE

Hidden message:

\_\_\_\_\_! (8,3,9,3,6)

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Age: \_\_\_\_\_

Send entries to:

**Pollution Busters Club**  
 Bay of Plenty Regional Council  
 Freepost Bay of Plenty Regional Council  
 PO Box 364  
 Whakatane 3158



# BuzzBOP'S FRIENDS



**Andy Bruere**  
Lake Operations Manager

## What do you do?

Put in place all the actions in the lakes to fix and protect our Rotorua Lakes.

## What's the best part of your job?

Working with people and communities to do a project that is going to fix lake water quality.

## What do you do to help water quality?

All of my work is aimed at fixing lakes, so everything I do should help water quality.

## What's your message to Pollution Busters?

We live in the best part of the world. Plenty of people want to live or work here because it is beautiful. Make sure you and your friends keep it that way.



*BuzzBop's Friends from the Bay of Plenty Regional Council's Communication and Engagement team. They help to bring you this newsletter and lots of other news from the council!*

Information for this newsletter was sourced and adapted from:  
Department of Conservation - [www.doc.govt.nz](http://www.doc.govt.nz)  
Kauri Park Nurseries - [www.kauripark.co.nz](http://www.kauripark.co.nz) (floating wetland information)  
Waikato Regional Council - [www.waikatoregion.govt.nz](http://www.waikatoregion.govt.nz)

Page 3 - How does a wetland work diagram adapted from [www.casperwv.gov](http://www.casperwv.gov)

Page 9 - Food chain diagram adapted from Department of Conservation Wetlands for Education in the West Coast Tai Poutini Conservancy January 2005 Edition 2

Page 10 - Te Wai Tapu diagram adapted from Maori Genealogy of Water Powerpoint - Ngati Tuwaretoa Fisheries



## Pollution Busters join up or change of address here...

Please have an adult check that the details are correct before you send this.

- I am a new Pollution Buster
- I am already a Pollution Buster but I have changed my address

Name \_\_\_\_\_

School \_\_\_\_\_ Birthday \_\_\_\_ / \_\_\_\_ / \_\_\_\_ day / month / year

Address \_\_\_\_\_

(Postcode)

**BuzzBOP and Team**  
Freeport Bay of Plenty  
Regional Council  
PO Box 364  
Whakatāne 3158  
[buzzbop@boprc.govt.nz](mailto:buzzbop@boprc.govt.nz)

Write your name, age and address on your letters and on the back of your artwork.

### Have you moved and changed address?

If you have moved and changed address, please write or email to us so we can make sure you get your newsletter.