



Issue 61 – December 2014

# Aquatic Pests

**Tēnā koutou e hoa ma - Hello Pollution Busters!**

We hope you had a great term of learning at school and are enjoying the holidays!

Now that summer is nearly here and we are out enjoying our waterways we thought it is a good time to learn about aquatic pests and how to stop them spreading in our streams, rivers and lakes. So with the help of my special friend Tuna we are going to learn all about them.

Thanks to everyone who entered the last competition, check out page 2 for the winning entries.

“Kia u, kia ngakaunui ki nga mahi pai”  
Be steadfast and conscientious in all your good work.

See you in 2015!

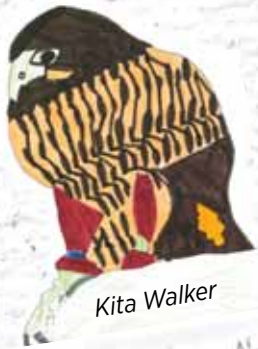
From BuzzBOP and the team at Bay of Plenty Regional Council.





# COMPETITION WINNERS!

Thanks to all of you who entered the last competition, check out the winners below!



Kita Walker

I love the New Zealand Falcon because it's flying is spectacular and they are a great species because their gorgeous.

I like Tui's because they are Proud, brave, beautiful and confident and they sing beautiful songs! I love tui's!

Shakaya Gosling Age 10



I like the Fantail because it has a tail like a fan and they fly about in the air.

Jamie, Age 9, Rotorua



I love the tui because when spring starts and ends they sing in the Kowhai trees in our back yard. On our computer the photos from spring are usually of the Kowhai and the tui. I love it when they call and sing! They are just an amazing native bird.

Anja, Age 12, Rotorua



I like Tui's because they have got a white ball on their necks and they have beautiful colours.

Isolde Camburn, Age 5, Ōhope

Nga mihi o te Kirihimete me te Tau Hou  
Season's greetings for Christmas and the New Year.

Send your drawings, photos, letters and competition entries to:

POST: Bay of Plenty Regional Council  
Pollution Busters Club  
Freepost 122076  
PO Box 364  
Whakatāne 3158

EMAIL: [buzzbop@boprc.govt.nz](mailto:buzzbop@boprc.govt.nz)



## Kia ora Pollution Busters

I am a Tuna or longfin eel. I am **not** an aquatic pest. I am endemic (only found here) and live my life in the wetlands, streams, rivers and lakes of New Zealand before heading out to sea to breed when I'm old.

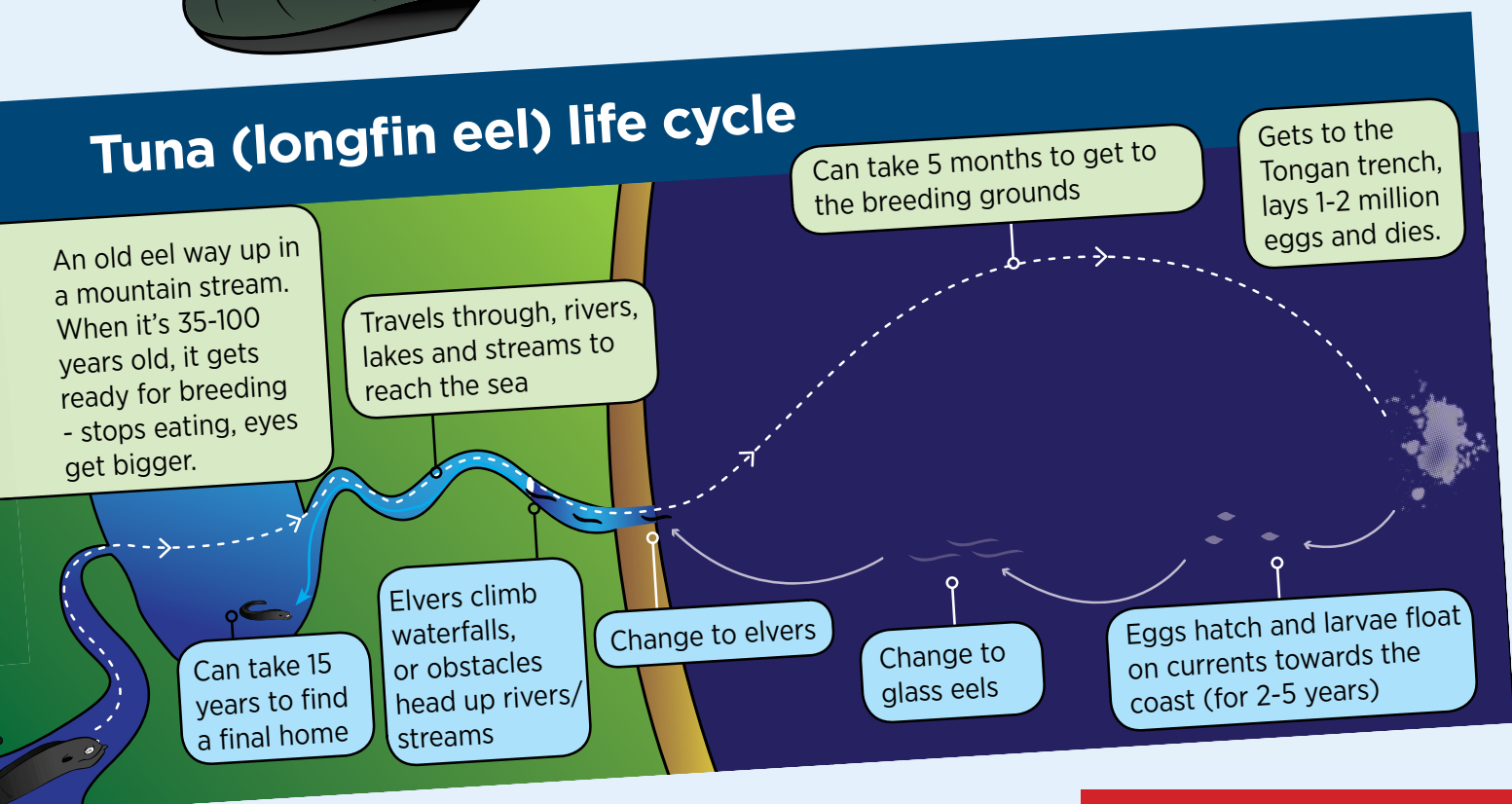
Join me on my journey to learn about freshwater aquatic pests, water quality and wetlands. There are some activities for us to do on the way. Let's go join the pest patrol!



**Q** How can you tell the difference between a shortfin and longfin eel?

**A** Longfins are generally black and wrinkle when you bend them. They are threatened so remember '*If it's wrinkly and black put it back*'.

## Tuna (longfin eel) life cycle



## COMPETITION

## DESIGN A POSTER

to teach people how to stop the spread of aquatic pests.

Post or email your entry to BuzzBOP by 30 January 2015

### You will need:

- A4 paper
- Your imagination (you could make a collage, use photos, be creative!)
- Felts, coloured pencils, crayons

### Poster design tips:

- Keep your message short and catchy (for example, Bathe your boat)
- Keep your writing large and easy to read
- Keep your picture clear and simple (not too detailed)
- Make it bright so everyone can see it!



# What are freshwater aquatic pests?

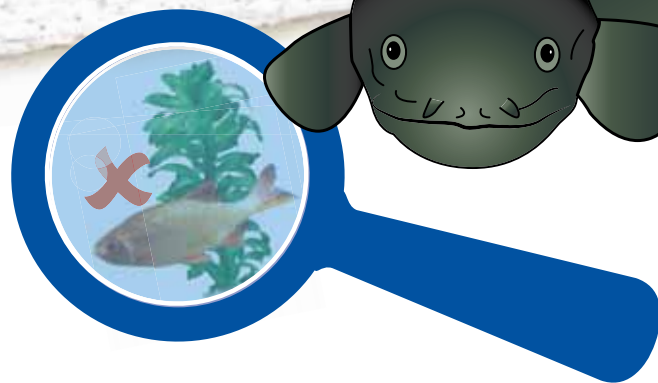
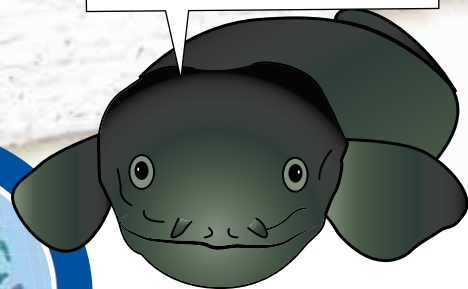
They are plants and animals that live in the wetlands, waterways and lakes. But they damage these habitats and also wipe out native species. We don't want them!

## How do aquatic pests damage our waterways?

Aquatic pests displace native plants and animals and affect the water quality in our wetlands, lakes and waterways.

take over or force them to go

Native aquatic plants and animals are ones that are a natural part of our water bodies. They have evolved and developed in New Zealand.



## Aquatic pest hunt!

Hidden in this puzzle are 17 aquatic pests.

Can you find them all to reveal the message?

ALLIGATOR WEED  
CATFISH  
DIDYMO  
EGERIA  
ELODEA  
GAMBUSIA  
HORNWORT  
HYDRILLA  
KOI CARP  
LAGAROSIPHON  
PERCH  
RUDD  
SALVINIA  
SENEGAL TEA  
SPARTINA  
TENCH  
WATER POPPY

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

HIDDEN MESSAGE:

\_\_\_\_\_  
\_\_\_\_\_!

## Aquatic pest plants

Some lakes are infested with submerged (underwater) weed beds. These weeds can sprout from a single piece of weed and spread super fast.

They take over the native lake plant beds which are home to many native species so instead we get, thick, tall, weed material that can:

- block the flow of water and increase the risk of flooding;
- smother our native plants and destroy the habitat of native fish;
- stop us having as much fun swimming, fishing and boating;
- make the water quality bad;
- stink – rotting weeds on shore don't smell good; and
- make our lakes and waterways not as attractive.

The good news is that some lakes are free of these weeds. The bad news is that they are easy to spread.



## Pest fish

Pest fish in the lakes can also cause problems.

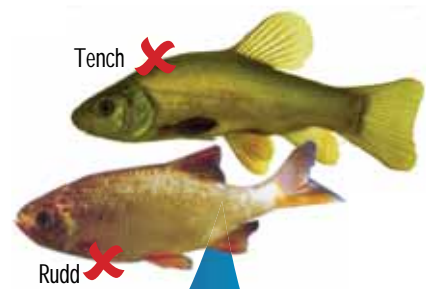
They stir up the bottom of the lake as they look for food, eat and remove aquatic plants, and prey on native fish and their eggs.

This makes lake water murky and wipes out native species. It also increases nutrients and algae.

They can also alter the food web so there is less zooplankton to eat algae.

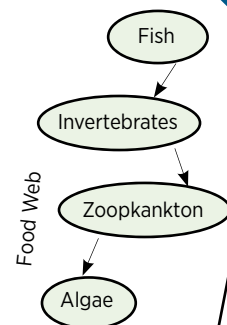
Fish eggs can be transported on weed attached to boat trailers.

The Rotorua lakes don't have many pest fish species yet and we want to keep it that way!



Some freshwater pests are microscopic and can be spread by a single drop of water.

Even if you can't see the danger you could be spreading it.



MICROSCOPIC = so small you can not see them without a microscope!

I am a pest, I rip up plants and make the water dirty. People used to keep me as a pet in ponds. You do not want me in the waterways.  
**WHO AM I?**

Find out who this pest is on the next page!



Fill in the gaps!

water

animals

Aquatic

plants

pest

bad

and

make

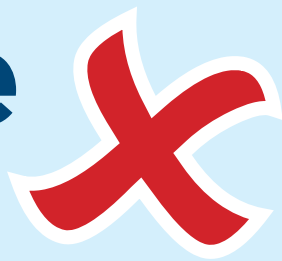
quality



Every year the weed harvester munches through and removes aquatic weed in some lakes to improve water quality.



# Meet the pests!



More pest fish and plants are listed in the pest hunt on page 4

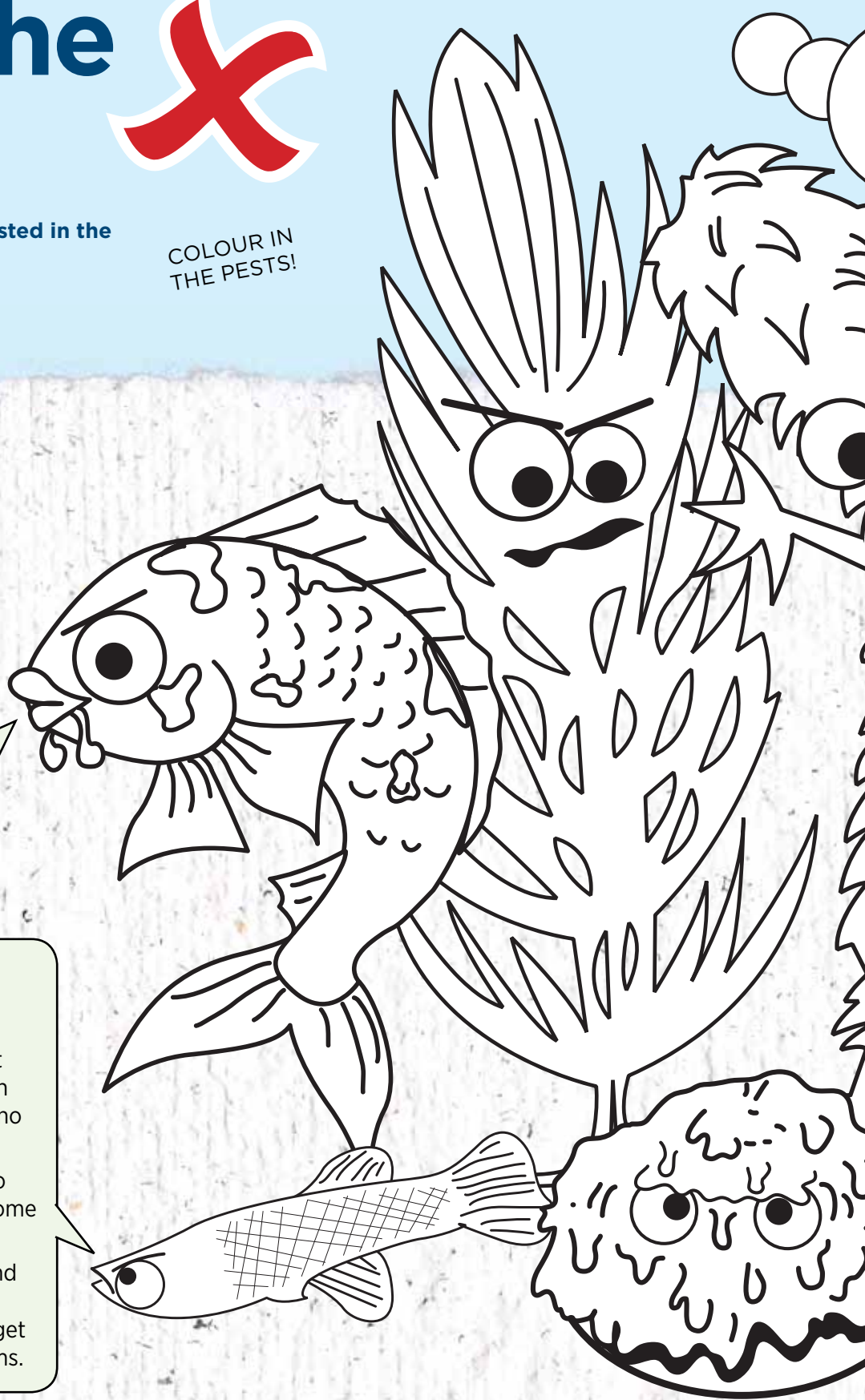
COLOUR IN THE PESTS!

## KOI CARP

- I look like a giant goldfish but I have barbels (“feelers”) at the corners of my mouth.
- I rip plants out and stir up the lake bottom, making the water dirty. This makes it hard for native fish and trout to survive.
- I am currently not found in the Rotorua lakes. The Department of Conservation (DOC) and the Bay of Plenty Regional Council are working with the community to keep me out.

## MOSQUITO FISH (GAMBUSIA)

- I am a widespread tiny fish that attacks adult fish by nibbling on their fins. This means they can no longer swim, so they die.
- I breed quickly, producing up to 300 babies at a time, they become adults within a month.
- I was introduced to New Zealand to control mosquitoes (that didn't work though!) and now get released illegally from aquariums.



Koi carp

Gambusia

Hornwort

Didymo

Lagarosiphon

## BLUE-GREEN AND GREEN ALGAE

- I can multiply quickly, doubling my numbers in a day.
- Water with blue-green algae in it can make you sick if you swim in it, drink it or even eat shellfish from there.
- Big groups of us can make spectacular and colourful algal blooms, but you STILL don't want us!

## LAKE WEEDS

### HORNWORT & LAGAROSIPHON

- We invade lakes and destroy native fish and wildlife habitat.
- We can form large floating mats on a lake blocking the pathway of boats, and the intakes of hydro-dams.
- When we die we collapse and smother native plants that grow deeper than us.
- We can grow to depth of 16m, and to a height of 7m (that's taller than a house!).
- We can grow from a small piece... so can accidentally be introduced to a lake by boat trailers, nets and aquarium dumping.

## DIDYMO (ROCK SNOT)

- I am an algae that grows from a single cell (invisible to naked eye) and can grow to form large thick slippery mats on rocks.
- I can grow so big and so fast that I take over places where other plants and animals usually live.
- I can be spread to a new waterway from a single drop of water.
- When I die I turn white and lose my grip on rocks. I then float and can look like toilet paper flowing downstream.
- I am in many South Island rivers, but luckily I am not in the North Island.

Algae

## What happens to the lake when the pests move in?

Look at what happens over time - the natives are replaced by pest plants, the water quality gets worse, then there are no plants and we end up with turbid water.

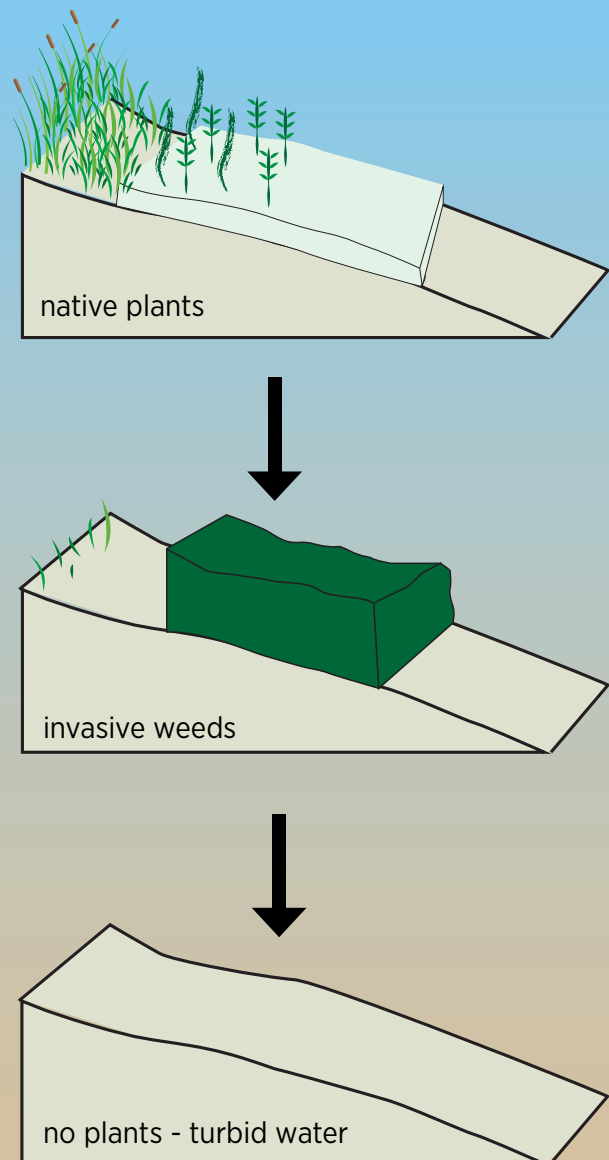


Diagram sourced and adapted from Niwa Alpha 123 Freshwater aquatic plants

**TURBID WATER** - Not clear and clean. It has things like algae and sediment in the water. The light then can't pass through it as well, so things can not grow or live there.



# How are aquatic pests spread?

By small fragments of plants or eggs on equipment moving from one waterway to another.

They can also be spread by ornamental ponds overflowing into waterways, or people not getting rid of plants and fish from their aquariums correctly. Check out the red box below on how to empty them the right way!

## How can we **STOP** them?

The best thing you can do to stop the spread of aquatic pests, is follow the Check, Clean, Dry actions if moving from one lake or river to another.

**CHECK** and remove weed from anything that has been in the water.

**CLEAN** everything for at least one minute with a 5 percent detergent solution.

**DRY** everything completely for at least 2 days. This is really important if you are boating in more than one lake, for example moving from Lake Rotoehu to Lake Rotoma.



## Emptying your aquarium or pond?

**Do not release aquarium or pond plants and fish into waterways!**

Plant material and gravel from aquariums should be thrown out with the household rubbish or composted. The water should be tipped onto the garden, well away from any water body (lake, river or stream).



## Lakes

Rotorua has 12 major lakes that were all created by volcanic activity.

They are checked quite often to see how clean they are. The water quality ranges from oligotrophic (excellent) to supertrophic (poor).

As we have already learned – pest plants and animals can affect water quality, but people (septic tanks) and farms (animal's poos and wees) can too. They can be washed through or over land and end up in our waterways – yuck!

**Check the water quality before you go swimming at [www.boprc.govt.nz](http://www.boprc.govt.nz) and remember...**

**If it's milky and green - it's best to stay dry and clean!**

**Native plants and insects can tell you how healthy the waterway is.**

**This is because some are more able to live in polluted water than others.**

For example in streams with good quality water you will find mayfly and stonefly larvae, but in more polluted, muddier, warmer streams you will find snails, fly larvae and worms.



## Māori and water

In Māori culture, water is the life-giver, it represents the blood of Papatūānuku, 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.

**The Māori word for water is wai.**

There are many rivers with names that begin with the word wai (water), like Waikato (flowing water) and Wairarapa (glistening waters).

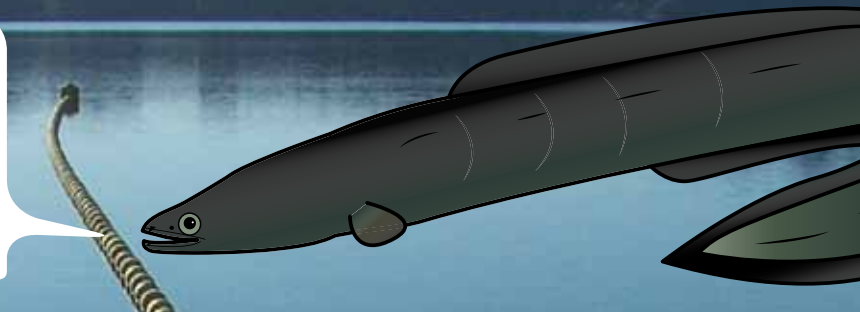
Can you think of any others?





## Have you seen a weed cordon?

They have been installed in some of the Rotorua lakes to try stop two of the worst aquatic weeds, hornwort and egeria.



## How do weed cordons work?

- The cordon (made of old fishing net) traps weeds which boats and trailers sometimes bring with them from other waterways.
- After launching from the ramp, boats travel over the net before getting into the lake and the net catches any weeds underneath the vessels as they pass over it.



### Spot the difference

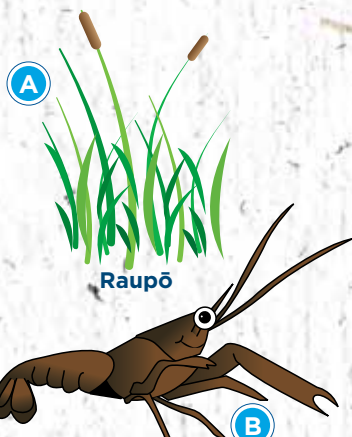
The top photo is the weed cordon at lake Okataina, the bottom picture has had 10 things changed - can you spot them all?



1. Weed cordon gone 2. sign moved 3. tree moved 4. vehicle and weed trailer 5. kayaker 6. kayaker 7. Algae in water 8. floating wetland 9. jetty gone 10. weed on lake edge

## Who are these natives?

Match the descriptions to the pictures.

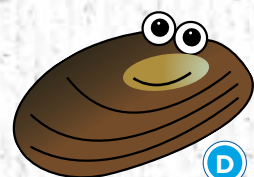


Koura (Fresh water crayfish)

- I'm a secretive, nocturnal fish found under aquatic plants, stones, banks and around sunken logs in shaded water. I don't have any scales. I can be known as whitebait, when I'm young.
- I attach myself to the fins or body of a small freshwater fish, when I'm a tiny baby. I can be found buried in mud in most of our streams, rivers and lakes. I am sensitive to pollution.
- Throughout history, people have used my rhizomes (roots) for food, leaves for thatching, pollen for flour and my seedhead 'fluff' as mattress stuffing. I can form large colonies, sometimes breaking away from the shoreline and establishing somewhere else.
- I like to live in small streams, lakes and rivers. I am the largest invertebrate (Invertebrates are animals that do not have backbones) found in NZ rivers. I have powerful pincers. My skeleton is on the outside of my body and my shell moults. I am very sensitive to pollution.
- I enter rivers from the sea during spring when I'm young. My family is getting smaller as people drain wetlands and clear forests, which destroys where we live as adults. I am a very strong climber when young and can even scale waterfalls!
- Fish hide in me to protect themselves from bigger fish, koura live in me. I hold lots of sediment and remove nutrients from the water which helps to keep the water clear.



Kōkopu



Kakahi (fresh water mussel)

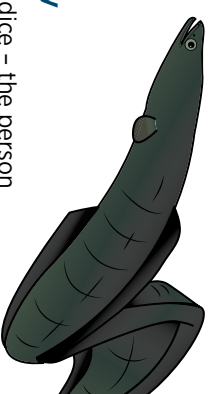


Koaro



Water milfoil

# ALGAE AND LADDERS

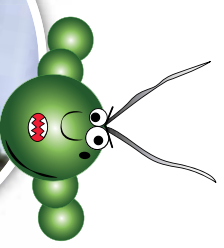


- You need:**
- a die
  - counters

## How to play

1. Throw the dice – the person with the lowest number starts first.
2. Throw the dice and move the number of squares shown.
3. If you land on a ladder – great, you have been environmentally friendly so climb up the ladder.
4. If you land on a red square you have not been environmentally friendly so slip down the algae.
5. Keep going until someone reaches the finish.

## Happy playing!



blue-green algae under a microscope

Blue green algae at the entrance to Ohau Channel, Lake Rotorua





# Wetlands for water quality!

What are wetlands? They are just 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) Wetlands are the natural boundary between land and water.

## What do they do?

They purify the water and are like big spongy filters, taking out sediment and nutrients that are washed off the land and the plants add oxygen to the water.

They also help reduce flooding, stop erosion and are home for diverse range of plants and animals.

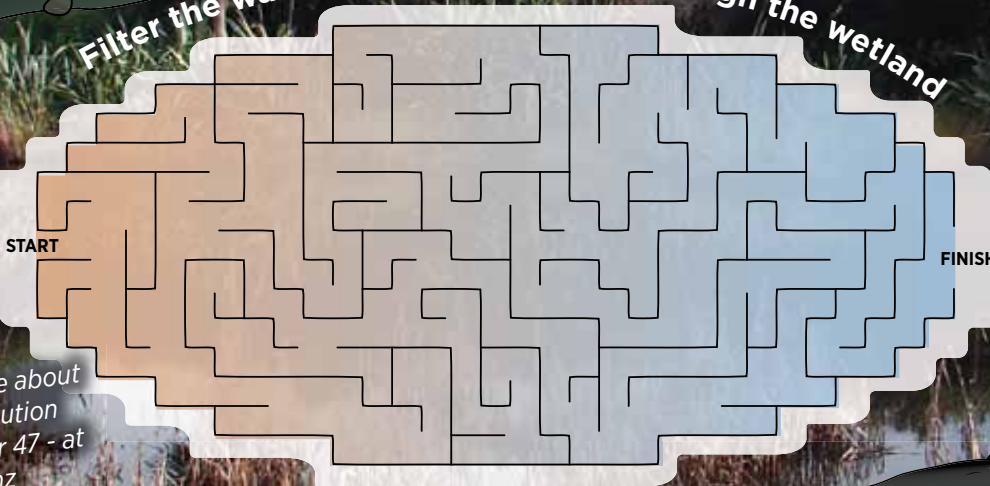
**FACT:** The Bay of Plenty has just three percent of the wetlands that were here when the Europeans arrived.

Many native fish like eels, bullies, kōkopu and īnanga use wetlands for some part of their life and some live there all the time.

## JOKE!

Why don't they build motorways through wetlands? If they did, traffic would get all bogged down!

Filter the water as make your way through the wetland



Want to know more about wetlands? See Pollution Busters Newsletter 47 - at [www.boprc.govt.nz](http://www.boprc.govt.nz)

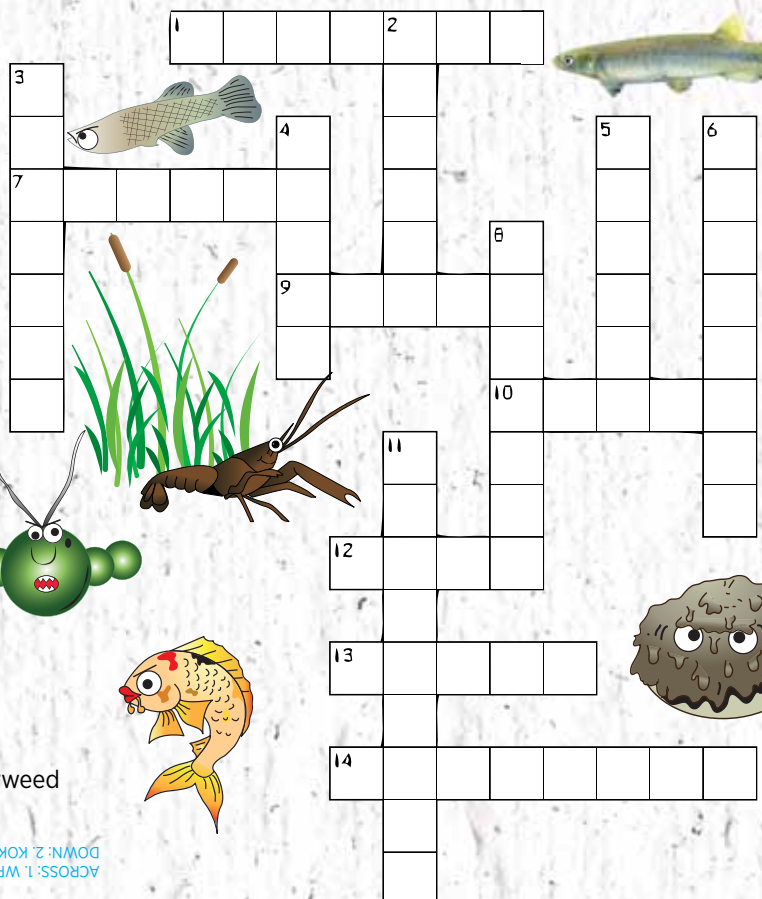
## CROSS WORD

### ACROSS

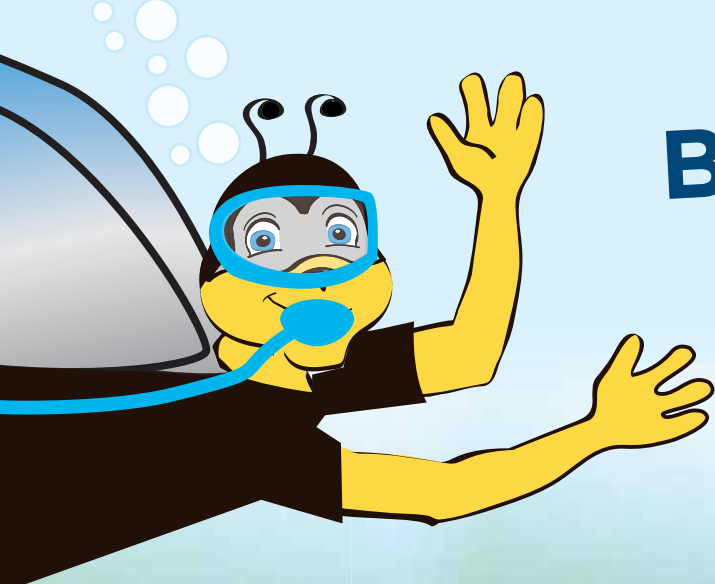
- If it's \_\_\_\_\_ and black put it back
- rock snot, can look like toilet paper
- my pollen was used as flour
- check, \_\_\_\_\_, dry
- \_\_\_\_\_ the spread
- if it's milky and \_\_\_\_\_, stay dry and clean
- small fish that will attack others

### DOWN

- Secretive nocturnal native fish
- Only found here
- Largest invertebrate found in New Zealand rivers
- Aquatic pest plants displace our \_\_\_\_\_ plants
- Rotorua's lakes were created by \_\_\_\_\_ activity
- Pest like a giant goldfish with barbells
- Where you should not release your pet fish or waterweed



ACROSS: 1. WRINKLY, 2. DIDYMO, 3. RAUPO, 4. CLEAN, 5. STOP, 6. VOLCANIC, 7. KOI CARP, 8. KOUKA, 9. ENDemic, 10. DISPLACE, 11. WATERWAYS, 12. STOP, 13. GREEN, 14. GAMBUSIA  
DOWN: 1. WRINKLY, 2. DIDYMO, 3. RAUPO, 4. CLEAN, 5. STOP, 6. VOLCANIC, 7. KOI CARP, 8. KOUKA, 9. ENDemic, 10. DISPLACE, 11. WATERWAYS, 12. STOP, 13. GREEN, 14. GAMBUSIA



# BuzzBOP's Friend

## Hamish Lass

Land Management Officer - Biosecurity  
(Terrestrial and Aquatic pests)

### What do you do?

I try to stop freshwater pests getting into our lakes.

### What is the best part of your job?

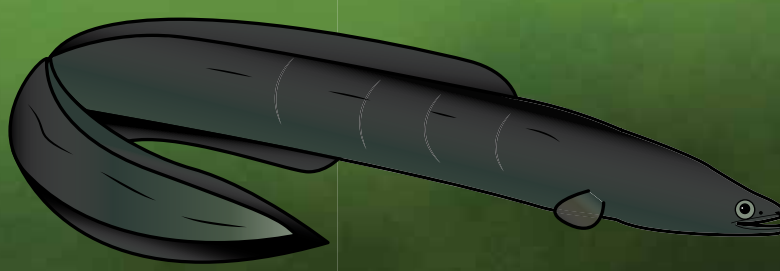
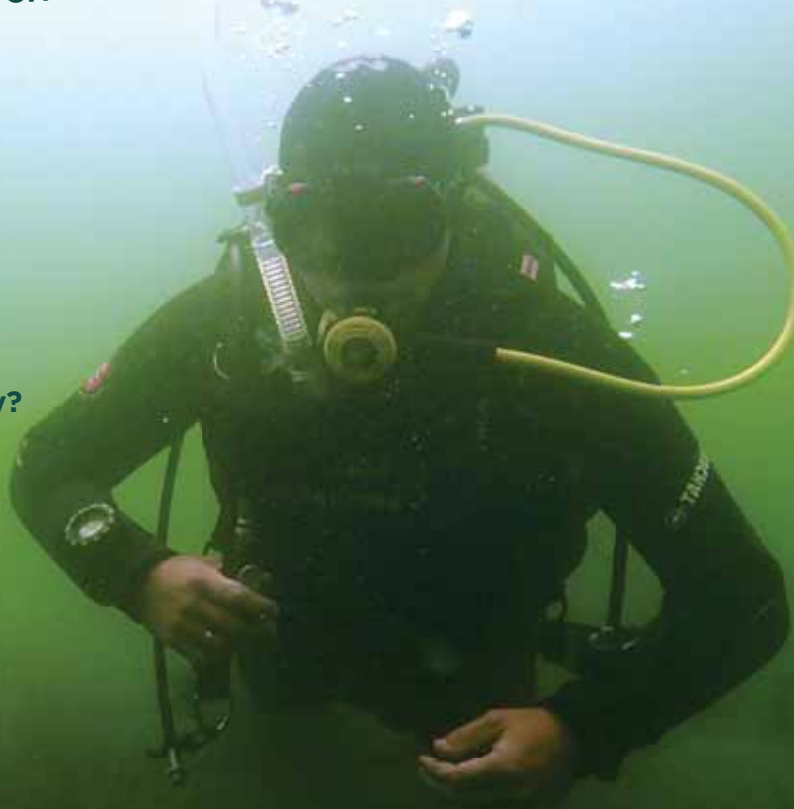
I get to go Scuba diving!

### What is your top tip for improving water quality?

Don't let any nasty liquids go down the drain and end up in our lakes and rivers.

### What is your message to pollution busters?

Look after our lakes and rivers so we can continue to swim and have fun in them.



See you in 2015 Pollution Busters! Keep up the good work!

Do you live in the Bay of Plenty?

Are you aged 3-15 years old?

Are you interested in learning about the environment and sustainability?

Join our Pollution Busters Club and get your free newsletter full of sustainable tips, competitions, games and puzzles.

Email [buzzbop@boprc.govt.nz](mailto:buzzbop@boprc.govt.nz) or return this form to become a Pollution Buster today!



☐ Yes, I want to join the Pollution Busters Club!

☐ Update my address

Name \_\_\_\_\_

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

Address \_\_\_\_\_  
\_\_\_\_\_



#### Post to:

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PO Box 364  
Whakatāne 3158

#### Email:

[buzzbop@boprc.govt.nz](mailto:buzzbop@boprc.govt.nz)