



Students from Te Kura Kaupapa Māori O Te Rotoiti plant the floating wetland on Lake Rotoiti 2011



**Floating Wetlands**  
Te Kūkuwai Rewa

Take action – making our own floating wetland

# Learning stage 4

## Learning stage 4. Take Action - making our own floating wetlands

Activity Title	Nature of Activity	Focusing question/s	Curriculum area	Suggested Curriculum level	Page
4a Action Plan	Create an action plan to make a floating wetland Reflect and discuss	What is the process for making a floating wetland? Who do we contact? What do we need? What do we do?	Social Science Science	Any level	227
4b Application process – what's involved?	View a PowerPoint Design a flow diagram of the application process Reflect and discuss	What does the application process for a floating wetland involve?	Social Science	Any level	231
4c Application process – who's involved?	In groups research about an organisation and report to the class Reflect and discuss	What agencies and organisations are involved in this process?	Social Science	Any level	235
4d Application process – data gathering	Complete applicant details on an application form Reflect and discuss	What information do we have to gather when applying to construct and place a floating wetland on one of the Rotorua lakes?	Social Science	Any level	241

## Activity 4a

# Action plan

### Focusing questions

- What is the process for making a floating wetland?
- Who do we contact?
- What do we need?
- What do we do?

### Resources required

- Action planner (labelled) template (see following pages)
- Plan for action template (see following pages)
- Glossary template. (See the glossary for student use, in the Learning Journal template supplied within the 'Resources' section of this document).

### Method

1. Break students into groups of five or six plus one adult (teacher/parent/expert etc).
2. Discuss in groups the process for making a floating wetland
3. Copy the Action Planner onto A3 paper (enough for one per group). In groups complete the planner.
4. Each group presents their Action Plan – and the teacher can make a class-wide Action Plan with all the information gathered.
5. Using the template “Plan for Action”, add names and dates beside all “jobs” that need to be completed.
6. Reflect using the questions below.
7. When new words are encountered, record the word(s) in the glossary template (See the glossary for student use, in the Learning Journal template supplied within the 'Resources' section of this document).

### Reflection questions

- How do you feel about group work – what works best for you?
- How was the delegation process – was it fair in your opinion? Why/why not?
- What was done well and what could have been done better?

#### Activity Title:

Action Plan

#### Nature of Activity:

Create an action plan to make a floating wetland

Reflect and discuss

#### Focusing question/s:

What is the process for making a floating wetland?

Who do we contact?

What do we need?

What do we do?

#### Curriculum area:

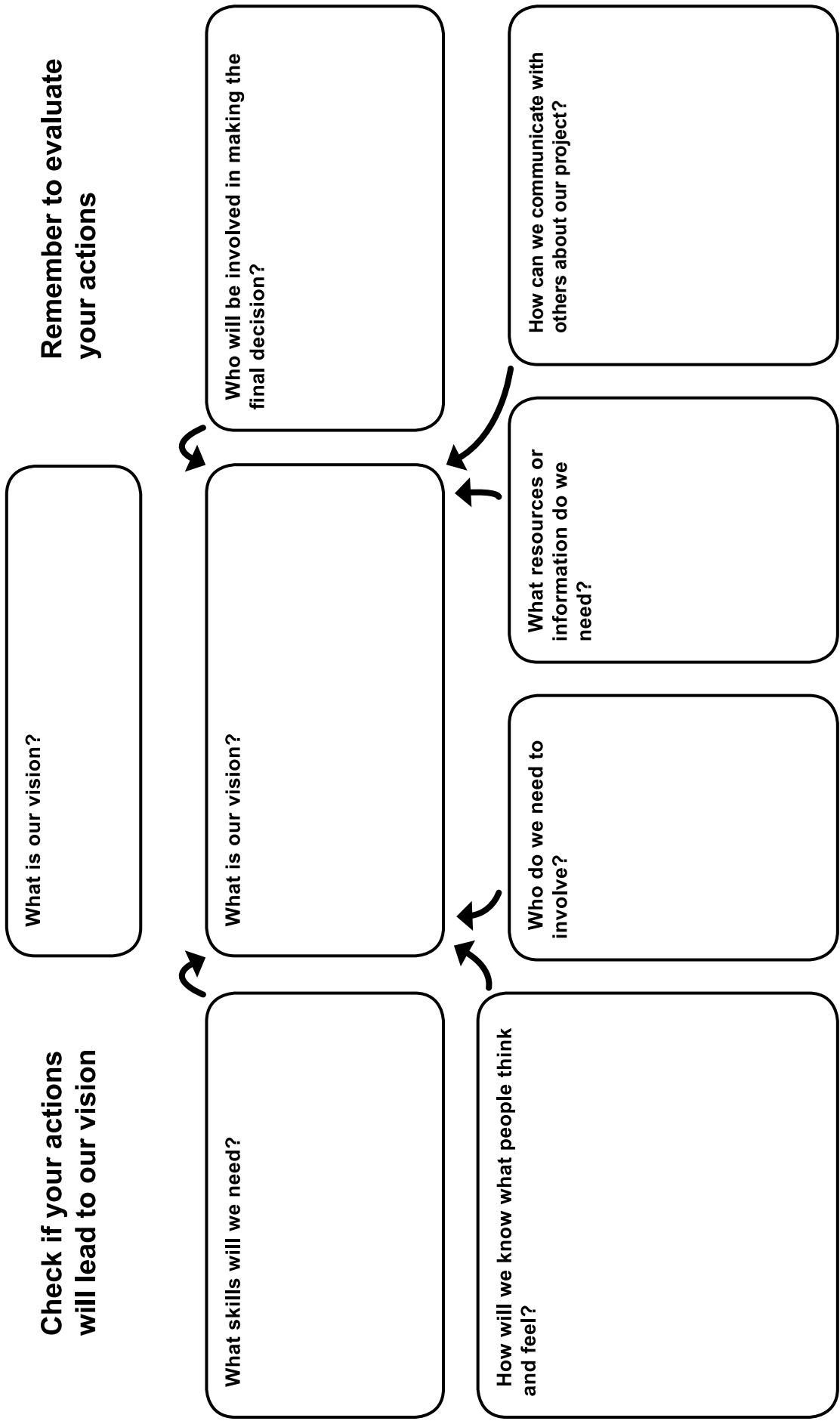
- Social Science
- Science

#### Suggested Curriculum Level:

Any level



# Student Resource Action planner (labelled) template



What is our vision?

**Check if your actions will lead to our vision**

What skills will we need?

What is our vision?

How will we know what people think and feel?

Who do we need to involve?

What resources or information do we need?

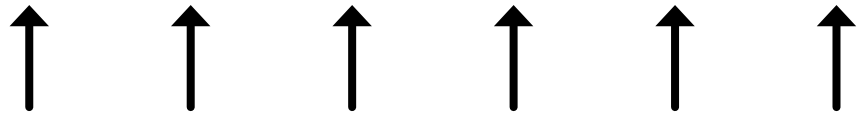
Who will be involved in making the final decision?

How can we communicate with others about our project?

**Remember to evaluate your actions**

**Student Resource**  
**Plan for action template**

What things are we going to do?						
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Who is going to carry out the task?						
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When will it be completed?						
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What support is needed?						
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## Activity 4b

# Application process – what’s involved?

### Focusing question

What does the application process for a floating wetland involve?

### Resources required

- PowerPoint: School Application Process (see following pages).
- Sample flow diagram - The Process of Applying for and the Siting of a Floating Wetland (see following pages)
- Teacher background information reading: An introduction to floating wetlands and the application process (see following pages)
- Glossary template. (See the glossary for student use, in the Learning Journal template supplied within the ‘Resources’ section of this document).

### Method

1. View the PowerPoint slides - Floating Wetlands – School application process - about the process for setting up a floating wetland.
2. View and discuss the first three slides specifically.
3. Ask students to design a simple flow diagram – and discuss these in groups and as a class.
4. Invite a guest speaker who has been through the application process – or talk to students from another school who have already done this!
5. Complete the reflection questions below.
6. When new words are encountered, record the word(s) in the glossary template (See the glossary for student use, in the Learning Journal template supplied within the ‘Resources’ section of this document).

### Reflection

- What is involved in the application process for a floating wetland?
- What is good or bad about this process?
- Who are the key agencies involved in the process? Do you understand what they do? (NOTE: We will explore these roles more in the following activity)

#### Activity Title:

Application process  
– what’s involved?

#### Nature of Activity:

Create an action  
plan to make a  
floating wetland  
Reflect and discuss

#### Focusing question/s:

What does the  
application process  
for a floating  
wetland involve?

#### Curriculum area:

- Social  
Science

#### Suggested Curriculum Level:

Any level

# PowerPoint

## Floating Wetlands – Application process for schools





**Floating Wetlands**  
Te Kūkūwai Rewa

### Application process for schools



### Setting up a floating wetland

- Set up a group of keen students and staff
- Identify where you want the wetland to be
- Apply to Te Arawa Lakes Trust and Bay of Plenty Regional Council for permission to anchor the structure to the lake bed
- Notify Fish and Game, Department of Conservation






### Application pack

- Introduction to floating wetlands, application process
- Application Form
- Funding application for Bay of Plenty Regional Council Environmental Enhancement Fund, Hāwea Vercoe Commemoration Fund
- Design specifications, contact details
- Te Arawa Lakes Trust application
- Resource consent 65952




- Return forms to Bay of Plenty Regional Council office
- Contact Kauri Park Nurseries to have floating wetland made
- Arrange a date for planting and placement

### Placement and planting




### Launch




### Maintenance

- Note any changes - contact Kauri Park if major structural damage
- Check that bird netting is secure
- Remove rubbish and weeds
- No unauthorised people on the wetland - it is not a diving platform
- Do not moor boats






# Teacher background information

## An introduction to floating wetlands and the application process

### Natural wetlands

Wetlands are areas containing submerged and emergent aquatic plants which are found in shallow water and on the margins of lakes and streams. They perform a range of useful functions, and establishing additional wetlands can help to restore the quality of the Rotorua lakes. As well as providing a valuable habitat for plants, insects, birds, fish and invertebrates, wetlands can also remove nutrients such as nitrogen (N) and phosphorus (P). High levels of nutrients can lead to algal blooms, poor habitat conditions for fish and invertebrates and restrict people's use of lakes. For more information on the value of wetlands and issues facing the future management of the Rotorua lakes see Bay of Plenty Regional Council's website [www.boprc.govt.nz](http://www.boprc.govt.nz) and follow the links to 'Rotorua Lakes'. This site also contains other useful factsheets).

### Floating wetlands

Floating wetlands take the idea of natural wetlands a stage further. By constructing wetlands on a purpose-built floating platform, the natural benefits of wetlands can be recreated, but with some additional advantages. Te Arawa Lakes Trust (TALT) and Bay of Plenty Regional Council want to encourage the creation of floating wetlands on lakes throughout the Rotorua lakes district. We have secured a resource consent which allows floating wetlands to be constructed and established on 11 of the 12 Rotorua lakes that are within the Lake Protection and Restoration Programme, subject to meeting the conditions specified in the resource consent. (Lake Rotokakahi is not included in the resource consent.)

We hope that iwi, schools, community and environmental groups will take the opportunity to develop their own wetlands and play their own part to save the lakes. A floating wetland has already been established on Lake Rotoehu and appears to be thriving, but we are undertaking scientific trials to establish how much N and P are removed by the wetland process.

### The floating wetland structure

The wetland is built onto a frame (module) made of recycled plastic and foam which gives strength, rigidity and floatation. It provides a suitable material for the plant roots to penetrate and extend up to one metre into the water below. Once established, the wetland removes nitrogen and, to a lesser extent, phosphorus from the lake water. Removing these nutrients will help to reduce the amount of algae in the lake water and reduce the risk of toxic algal blooms which can be damaging to people and led to the summer closure of some lake areas in the past. The trailing roots also help to trap sediment which can discolour the water.

Each module is 4m x 1.6m, but they can be joined or made into irregular shapes to make larger structures. Two or more modules forming a wetland of approximately 13 m<sup>2</sup> can remove significant quantities of nutrients. They can be assembled at a suitable shallow water area and towed to the appropriate location and anchored. If necessary they can be moved around the lakes.

### Plant species

A range of native wetland species may be used. The floating wetland manufacturer will supply all the plants. Cutting the plants will stimulate growth, removing nitrogen and phosphate from the lake system. Cutting is not essential, as the wetland stimulates a process of de-nitrification converting nitrogen in water to nitrogen gas which is returned to the atmosphere. Phosphorus is absorbed by plant growth, and some of the dead material sloughed off the root system will ultimately be absorbed into the lake sediments.

### What can you do now?

TALT and Bay of Plenty Regional Council encourage groups to identify suitable locations for floating wetlands. We will not carry out the work, but we'll help you in the process.

The placement of floating wetlands is covered by resource consent 65952 issued by Bay of Plenty Regional Council. This is a blanket consent application covering Lakes Restoration Programme areas (except Lake Rotokakahi). Now you can begin the process of finding your site. If your group is not the adjacent landowner, the Regional Council has some ideas about possible sites.

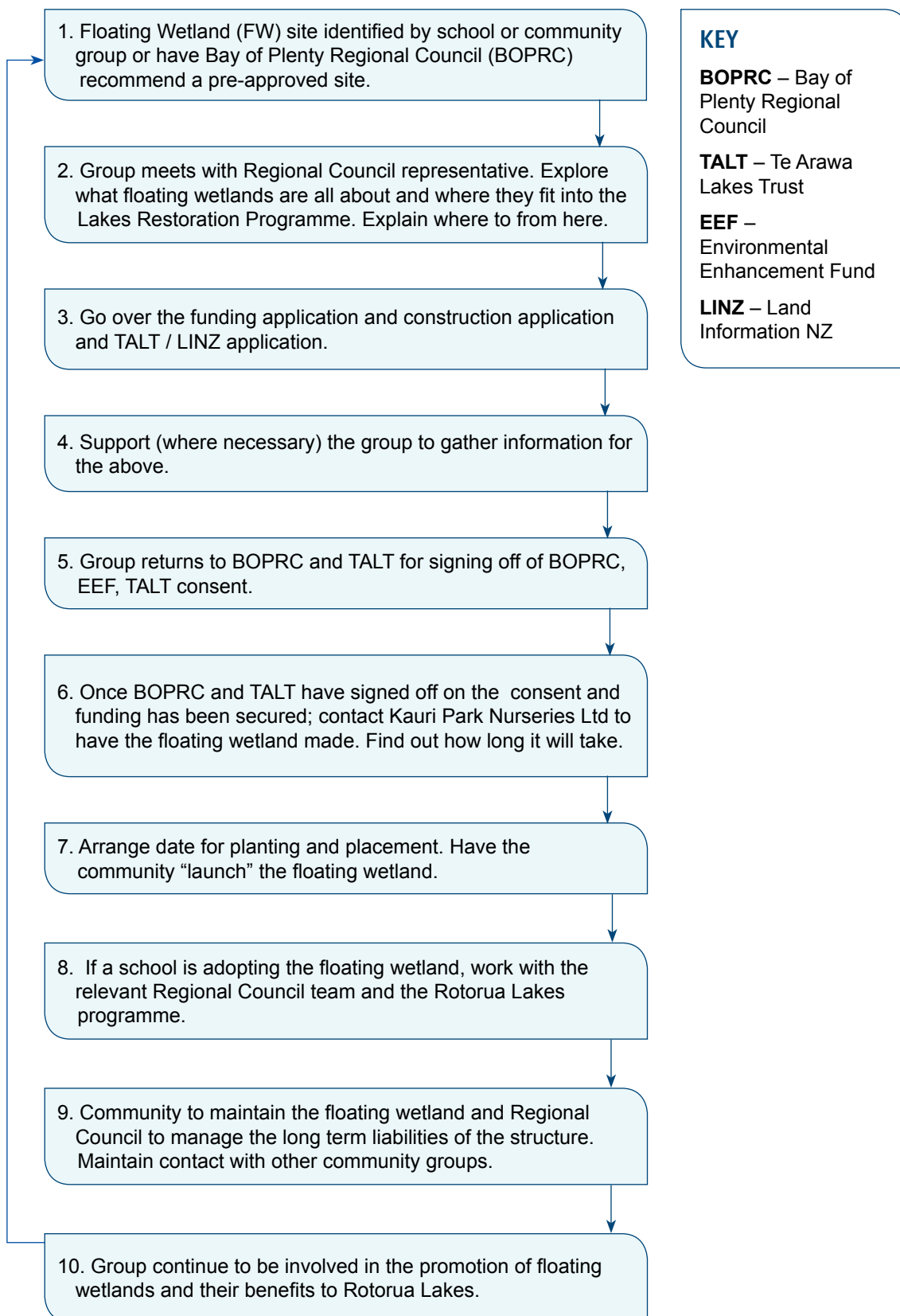
To meet the resource consent requirements, you need to consult with affected groups (iwi, DOC, Fish & Game Council, Rotorua District Council etc) for every wetland that you wish to establish. Proof of consultation must accompany the application form.

Once you have completed consultation, you can apply on the form provided in the Applicants Pack. The application needs to be approved in writing by both Te Arawa Lakes Trust and Bay of Plenty Regional Council before work can begin.

Funding may be available through Bay of Plenty Regional Council's Environmental Enhancement Fund. See the application pack or [www.boprc.govt.nz/sustainable-communities/funding-and-awards/environmental-enhancement-fund/](http://www.boprc.govt.nz/sustainable-communities/funding-and-awards/environmental-enhancement-fund/)

## Student / Teacher background information

# The process of applying for and the siting of a floating wetland



## Activity 4c

# Application process – who's involved?

### Focusing question

What agencies and organisations are involved in this process?

### Resources required

- Floating Wetland application form (see following pages)
- Fact sheet - The respective roles, responsibilities and legislative requirements of the statutory parties (see following pages)
- Glossary template. (See the glossary for student use, in the Learning Journal template supplied within the 'Resources' section of this document).

### Method

1. As a class, look at what organisations are involved with the application form and process.
2. Then in groups, ask each group to choose one of the parties.
3. Research the organisation; find out:
  - (a) What is the function of the organisation?
  - (b) What is its role in establishing a floating wetland?
4. Ask students to create a 'report' to class on who the group is, what they do and why it is important that the organisation is consulted in the application process.
5. Complete the reflection questions below.
6. When new words are encountered, record the word(s) in the glossary template (See the glossary for student use, in the Learning Journal template supplied within the 'Resources' section of this document).

### Reflection

Why do you think it is important to consult with:

- (a) Local iwi
- (b) Fish and Game
- (c) Department of Conservation.

#### Activity Title:

Application process  
– who's involved?

#### Nature of Activity:

In groups  
research about an  
organisation and  
report to the class

Reflect and discuss

#### Focusing question/s:

What agencies  
and organisations  
are involved in this  
process?

#### Curriculum area:

- Social  
Science

#### Suggested Curriculum Level:

Any level

## Fact sheet

# The respective roles, responsibilities and legislative requirements of the statutory parties

**Bay of Plenty Regional Council and Te Arawa Lakes Trust (TALT) are the organisations behind the floating wetlands initiative. This is part of the Rotorua Lakes Protection and Restoration Action Programme.**

**Consultation with Fish & Game, Department of Conservation and local iwi in developing the floating wetlands project has been very positive.**

### Bay of Plenty Regional Council

Bay of Plenty Regional Council (BOPRC) monitors the effects of human activities on our environment. It also promotes the sustainable management of our natural and physical resources for present and future generations.



### Te Arawa Lakes Trust

The Te Arawa Lakes Trust (TALT) is one of seven Māori iwi (indigenous peoples) of New Zealand. The area traditionally covered reaches from a small settlement named Maketū on the eastern seaboard to Tongariro mountain in the central North Island.



TE ARAWA LAKES TRUST

Their vision is "Kia tu motuhake a Te Arawa i roto i te whakakotahitanga ma te urupu me te whakatutuki o o tatau tikanga" "Te Arawa to be unified and independent, based on a strong understanding and practice of their tikanga" ([www.tearawa.iwi.nz/content/about-trust](http://www.tearawa.iwi.nz/content/about-trust))

TALT has worked extremely closely with Bay of Plenty Regional Council to establish floating wetlands in the Rotorua Lakes. Bay of Plenty Regional Council recognises the rights of TALT as owners of the lake beds. They work together seeking consents to place and use floating wetlands over the beds of 11 Rotorua Lakes. TALT support/tautoko the concept of floating wetlands as they see it as a key intervention in the Lakes Restoration Programme and a way of promotion and education for local communities, hapū, iwi and schools.

### Land Information New Zealand (LINZ)

Land Information New Zealand (LINZ) is a Government department responsible for land titles, geodetic (shape and area of the earth) and cadastral survey (legal surveying) systems, topographic information, hydrographic information, managing Crown property and a variety of other functions. TALT and LINZ have a formal relationship as part of the Te Arawa Lakes Settlement Act and a joint application form is required to be filled out to seek approval of installing a new lakes structure or modifying an existing lake structure.



### Fish & Game New Zealand

Fish & Game New Zealand is the collective brand name of the New Zealand Fish & Game Council and 12 regional Fish & Game Councils established in 1990 to represent the interests of anglers and hunters. It coordinates management, enhancement and maintenance of sports fish and game bird resources and their sustainable recreational use by anglers and hunters of New Zealand. Fish & Game support projects that will improve the water quality of the Rotorua Lakes



## Department of Conservation

The Department was formed in 1987 when the Conservation Act was passed to integrate conservation management functions. This Act sets out the majority of the Department's responsibilities and roles.



Consultation with DOC is essential when siting a floating wetland. If there are legislative items that transgress the Acts of Parliament they have the right to turn down the establishment of a wetland on that site.

## NIWA

National Institute of Water and Atmospheric Research (NIWA) is a Crown-owned research and consultancy company, with a global reputation as experts in water and atmospheric research.



Its mission is to conduct leading environmental science to enable the sustainable management of natural resources for New Zealand and the planet.

NIWA is responsible for managing the floating wetlands at Otautu Bay and monitoring the trial wetlands at Matawhaura Farm with water coming from Te Maire Stream and flowing into Lake Rotoehu. This project is under contract to Bay of Plenty Regional Council.

## Rotorua Lakes Council

Rotorua Lakes Council (formerly Rotorua District Council) has overall responsibility and accountability for the proper direction and control of the Council's activities.



## Kauri Park Ltd

Kauri Park Ltd, in alliance with NIWA, has developed the Floating Treatment Wetland system. The environmental goal of Kauri Park Ltd is to develop natural treatment systems that prevent the discharge of pollutants into the natural environment from agricultural, urban and industrial systems.



Kauri park have local staff who are able to assist planting and launching of a structure, and consultation on siting and specifications is needed soon after signing off to allow for quick delivery.

## Rotorua Te Arawa Lakes Strategy Group

The Rotorua Te Arawa Lakes Strategy Group is the overarching management group made up of representatives from Bay of Plenty Regional Council, Te Arawa Trust Board and Rotorua Lakes Council.



It coordinates policy and actions to improve the Rotorua lakes. The committee is now established in law as part of the Te Arawa Lakes Settlement for coordinated management of the Rotorua Lakes.

A Memorandum of Understanding has been developed between the Crown, Rotorua Lakes Strategy Group consisting of Te Arawa Lakes Trust, Rotorua Lakes Council and Bay of Plenty Regional Council to assist the four partners in addressing the future of the Rotorua Lakes and maintain or improve the water quality of the Rotorua Lakes through the Rotorua Lakes Programme.

[www.rotorualakes.co.nz](http://www.rotorualakes.co.nz) Strategy document: <http://www.rotorualakes.co.nz/vdb/document/533>



# Floating Wetland Application Form

An application is required as part of the resource consent process for each floating wetland developed. Written approval from Te Arawa Lakes Trust and Bay of Plenty Regional Council is necessary before you start any work.

1. The attached application form should be completed and returned to Bay of Plenty Regional Council.
2. You will need to get permission from the Affected Parties as well. These are the organisations that have some say in how the Lakes are managed. They will comment on the application. These organisations can suggest changes they would like to see, if necessary. See the application pack for their addresses.
3. Include a location map and aerial photograph (these can be downloaded from Google Earth or Bay of Plenty Regional Council may be able to help). The planned floating wetland location needs to be marked on both.
4. The floating wetlands (including plants and all associated materials) will be provided by Kauri Park Nurseries. A design specification sheet is included in the applicants pack. We suggest that you start fairly small with a simple design.
5. A complete application will include:
  - the completed form;
  - written sign off from affected parties;
  - location map and aerial photograph

Te Arawa Lakes Trust and Bay of Plenty Regional Council hold resource consent to place floating wetlands on the following Rotorua Lakes;

Rotorua, Rotoiti, Rotoehu, Rotomā, Ōkātina, Tarawera, Ōkāreka, Tikitapu (Blue Lake), Ōkaro, Rotomahana, Rerewhakaaitu.

### Applicant Details

<b>Name of group or individual</b>	
<b>Type of Group</b> (iwi, school, Rotary, ratepayers etc)	
<b>Contact name</b>	
<b>Address</b>	
<b>E-mail</b>	
<b>Phone number</b>	

### Proposed Location of the Floating Wetland

<b>Lake</b>	
<b>Map Reference</b> (NZMS 260 Series or GPS Co-ordinates)	
<b>Closest Road</b>	
<b>Closest Property Owner</b>	
<b>Site Location</b> (as close to wetland location as possible)	



## Consultation

Please provide written evidence of consultation with the following;

Adjacent landowner		✓ Details attached
Iwi		✓ Details attached
Fish and Game Council		✓ Details attached
Department of Conservation		✓ Details attached
Others – Please specify		✓ Details attached

## Floating Wetland Design\*

Dimensions	
Anchorage System	
Approx Water Depth at Anchorage Site	
Plant Species and Numbers	
Proposed Date of construction and placement	

\* Design specifications are available via Bay of Plenty Regional Council

### Maintenance

The floating wetland requires minimal maintenance, but the group will be responsible for checking moorings, occasional weeding and general inspection.

### Subsidy

Some funding may be available from the Bay of Plenty Regional Council. It is the group's responsibility to apply for and secure funding.

### Next Step

No work is to be started until the proposal has been approved and a copy of this form returned to you (the applicant), signed by the consent holders – Te Arawa Lakes Trust and Bay of Plenty Regional Council.

Signed on behalf of the applicant:

Signed	Please print name
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### For official use only

Date Received BOPRC	Date Approved BOPRC	Signed By <i>(Print Name)</i>
Date Received TALT	Date Approved TALT	Signed By: <i>(Print Name)</i>





## Activity 4d

# Application process – data gathering

### Focusing question

- What information do we have to gather when applying to construct and place a floating wetland on one of Rotorua lakes?

### Resources required

- Floating wetlands application form (see previous pages, from Activity 4c)
- Google earth
- GPS device (if available)
- The Bay eXplorer Map Information Site (You can access this via the Bay of Plenty Regional Council website under 'Regional Mapping' or by clicking on the following link: – <http://www.boprc.govt.nz/discover-our-region/regional-mapping/>)
- Glossary template. (See the glossary for student use, in the Learning Journal template supplied within the 'Resources' section of this document).

### Prior learning

Research skills; use of Google earth; map reading; local knowledge

### Method

1. In groups, complete the Applicants Details: the school's details
2. Then, use a map to note the location of floating wetland and:
  - identify the lake the floating wetland is being placed on
  - identify closest road
  - note map reference/co-ordinates (or use Google Earth or Geoview on BOPRC website)
  - use local knowledge or inquire at Rotorua Lakes Council to find out who the closest property owner is.
3. Reflect using the reflection questions below.
4. When new words are encountered, record the word(s) in the glossary template (See the glossary for student use, in the Learning Journal template supplied within the 'Resources' section of this document).

### Reflection

- Why do you think this information is required (i.e. the applicant details, location of wetland etc)?
- Why do you think there are design specifications?
- What do you think of the application process? What is good and bad about it?

#### Activity Title:

Application process  
– data gathering

#### Nature of Activity:

Complete applicant details on an application form

Reflect and discuss

#### Focusing question/s:

What information do we have to gather when applying to construct and place a floating wetland on one of Rotorua lakes?

#### Curriculum area:

- Social Science

#### Suggested Curriculum Level:

Any level