

# Theme three:

# Human impact on the Harbour

Level 5 Social Science

Level 5 Science



*Living  
Waters*

TIAKINA NGĀ TAONGA - PROTECT THE TREASURES

# Theme three:

## Human impact on the Harbour

### Level 5 Social Science      Level 5 Science

#### Social Studies Achievement Objective:

- Investigate how people’s management of resources impacts on environmental and social sustainability.

#### Science Achievement Objective:

- Investigate the interdependence of living things (including humans) in an ecosystem.
- Develop an understanding of socio-scientific issues by gathering relevant scientific information in order to draw evidence-based conclusions and to take action where appropriate.

#### Conceptual understandings:

- Formal and informal structures have been created to manage human impact on Porirua harbour.
- These structures are often based on evidence gathered from scientific investigation and influenced by cultural perspectives.

### Learning framework

Links to social inquiry approach	Activities	What to look for
<b>Establishing what we know</b>		
Focus of learning topic What is a resource?	1. Our precious resources	Building conceptual understandings of key concepts regarding resources such as: finite, infinite and carrying capacity.
<b>Building on knowledge</b>		
Finding information What are the resources within the Catchment area?	2. The Porirua Harbour and Catchment as a resource. View: <i>April: Pollution</i>	Deepening understanding of the <ul style="list-style-type: none"> <li>Different components which make up the resource that is the Porirua Harbour</li> <li>Threat of human impact on the resource.</li> </ul>
<b>Experiencing the Harbour</b>		
Putting it into context How has human action changed the Harbour?	3. Human impact on the harbour View: <i>December: The Future</i> 4. Field trip – train journey through the catchment. 5. Group research project	Deepening understanding of how human action directly impacts on the Porirua Harbour and Catchment <ul style="list-style-type: none"> <li>Key issues to understand include sedimentation, pollution and ecological degradation.</li> </ul> Developing critical thinking by Encouraging students to think of the reasons behind - and the consequences of - the decisions that were made.

Planning for action		
<p>Exploring values and perspectives</p> <p>Who will be happy about council environmental reforms?</p> <p>Considering responses and decisions</p> <p>What changes would you like to see?</p>	<p>6. Perspectives role play looking closely at the Pauatahanui – Judgeford Structural Plan</p> <p>7. Considering options for action</p>	<p>Developing critical thinking by</p> <ul style="list-style-type: none"> <li>Analyzing different strategies that have been put in place to protect the the Porirua Harbour and Catchment from pollution</li> <li>Considering the consequence of these actions.</li> <li>Thinking about how they can exercise kaitiakitanga over the Porirua Harbour and Catchment themselves.</li> </ul> <p>Developing a sense of kaitiakitanga by using initiative and exercise kaitiakitanga over an area within the Porirua Harbour and Catchment.</p>
So what, now what		
<p>Social action</p> <p>How did I make a difference?</p>	<p>8. Reflection</p>	<ul style="list-style-type: none"> <li>Looking back at what they learnt as part of the study and how their action has had an impact on the future of the harbour and catchment. What does this mean for their ongoing sense of kaitiakitanga?</li> </ul>

## Establishing what we know

### Activity 1: Our precious resources

Write the word resource on the board.

- In pairs students write down all the words they can come up with for this term. Share with the class.
- Ask students to come up for a definition for the term natural resource.

Discuss the terms *finite* and *infinite*.

- Write a T Chart with finite resources on one side and infinite resources on the other.

Discuss the concept that trees may be infinite; however, if they are chopped down faster than they can grow and are not looked after, they won't be replaced.

Ask students to add a third column to their chart and note down conditions required for a resource to remain infinite.

Select a resource – such as water – and discuss its importance.

- Imagine that there has been a drought in NZ and we need to preserve the water we have in the school tank. How are we going do this?
- What formal and informal structures could we appoint to ensure that it is looked after and managed fairly?

- Look at the role different people or groups of people within the school could play, i.e. the student council, the Principal, a group of concerned students, etc.

## Building on knowledge

### Activity 2: The Porirua Harbour and Catchment as a resource

Explain to the class that they are going to investigate a social action they could carry out within the Porirua Harbour and Catchment. In preparation for this, they will look at how decisions have been made in the past and what could be done in the future to protect the health of the harbour.

Discuss the Porirua Harbour and Catchment as a resource:

- What are the different components that make up this resource? How does it benefit us, now and in the past?
- Is it an infinite resource? What will affect its ability to be an ongoing resource?
- What is unique about the ecosystems within of the Porirua Harbour and Catchment?
- What types of groups exist to ensure the health of the Porirua Harbour and Catchment is well managed?

**Watch the Living Waters Documentary: *April Pollution***

- Ask students to note down all the various types of human impact that are threatening the health of the Porirua Harbour and Catchment. Examples include urbanisation, stormwater, zinc from tyres.
- Discuss as a class and write findings on the board.
- What habitat types exist in the Porirua Harbour and Catchment? Why are these at risk?
- What scientific investigations are discussed in the documentary? What do the findings tell us about the (health of the) harbour?
- What suggestions does Juliet Milne give about how human decisions can impact the harbour?

## Experiencing the Harbour

### Activity 3: Human impact on the Harbour

As a class watch the *Living Waters* episode: *December, the future*.

Discuss:

- Who are the different people (or groups of people) featured in the film who value the harbour? (Stakeholders)
- How has human impact changed our harbour?

Draw a T chart of formal and informal social structures that have been created to manage the human impact.

- What is the *Porirua Harbour and Catchment Strategy and Action Plan*? Who is involved? Is it a formal or informal structure?
- What are the solutions going forward?

### Activity 4: Field trip – train journey through the catchment

Travelling by train is an excellent way to experience the harbour and catchment. It's possible to travel from Plimmerton through to Takapu Road and observe the different types of habitats in the catchment (swamp, outer harbour, Onepoto and Pauatahanui arms, and streams), as well as visible evidence of how human activity has impacted on the quality of the harbour as a natural resource. For example Porirua Stream changes a lot from Takapu Road Station through to Porirua Station, from healthy natural edges through to unhealthy looking water, litter and hard artificial edges once it gets closer to the industrial zone of Kenepuru. Students will also be able to observe a variety of human activities that would have an impact on the harbour such as roads and housing, farmland, stormwater outlets, the reclaimed land around Mana Marina and so on. Encourage students to take photographs or draw pictures of the things that they see.

Planning a scavenger hunt type activity beforehand will help focus student's attention and guide their observations. There are also

opportunities to get off the train to either explore streams and waterways (e.g. Takapu Road or Redwood), or the outer harbour such as Plimmerton Beach.

If a train journey is not possible, visit your local stream or beach and conduct a simple survey of the organisms and human impact.

As with all field trips we strongly urge teachers to visit the site prior to taking students there. The Ministry of Education has excellent guides for safe outdoor experiences:

<http://eotc.tki.org.nz/EOTC-home/EOTC-Guidelines>

### Activity 5: Group research project

Using the *Living Waters* documentary series, Porirua Harbour and Catchment Strategy Plan and other resources, students are to research in groups an area of the Porirua Harbour and Catchment that has been affected by human impact. A list of publications can be found on the PCC website: <http://www.pcc.govt.nz/Publications/Porirua-Harbour-and-Catchment-Management-Programme> (Scroll down for the literature review)

The main issues to investigate include: sedimentation, pollution and ecological degradation (as suggested in the Porirua Harbour and Catchment Strategy Action Plan).

Students are to locate a body of established research that has been used as evidence to show the impact of human impact on the harbour and catchment. For example the annual research done by scientists Leigh Stevens and Barry Robertson – Wriggle Coastal Services as seen on the April: Pollution *Living Waters* series. Research questions could include

- Who commissioned the research and what did it aim to find out?
- What are the causes behind the human activity and what are the effects on the harbour and catchment?
- What are the plants, animals and habitats of the harbour and catchment and how are they affected or otherwise?
- Discuss what social structures (both formal and informal) have been created in response to this research. e.g. informal responses such as planting days organized by the Guardians of Pauatahanui Inlet (GOPI) or PICT (Pauatahanui Inlet Trust), Forest and Bird or more formal such as the Porirua Harbour and Catchment Strategy Plan.
- How have people responded to these initiatives?
- What else could be done? Are there any further initiatives in development?

Suggested films to help with research:

August: Sediment: Discussion of the importance of the estuary and its significance as the only one of its kind in the lower North

Island. Models are also looked at which have been used to measure the amount of sedimentation and the wider implications.

October: Rural Catchment: This film outlines the joint project of WRC and PCC to work with landowners in the Pauatahanui catchment to look at the reduction of nutrients and sediment going into the inlet via streams. It also shows how the deforestation of the 1840s has caused this issue or erosion, flooding and sedimentation going into the stream.

November: Urban Catchment: Naomi Middleton explains the 'Take Charge' programme which was developed in 2004. It is an environmental audit programme that works with businesses to help them comply with the rules. Dr Mike Joy also looks at the freshwater fish and how they are continuing to decline.

April: Juliet Milne – Environmental Science GWRC discusses the role of storm water in catchment. We are also introduced to scientists Leigh Stevens and Barry Robertson – Wriggle Coastal Services as they complete their annual broadscale mapping of the Harbour.

June: Urban Catchment: Professor John Wells measures the flow and water clarity of the streams by Duck Creek. Dr Mike Joy discusses the fish life in the streams and how they are affected by human impact such as washing cars and paint brushes. He explains the importance of the streams to the lifecycle of the fish.

December: We see the clean up of the Okowai lagoon, downstream of the Aotea Block development and at the active management process for transmission gully.

## Planning for action

### Activity 6: Perspectives role-play

As a class look at the [Pauatahanui-Judgeford Structure Plan](#).

The Porirua City Council adopted this plan in 2012 as a framework for land development in the Judgeford basin. Here we see the results of a formal structure putting controls in place to limit the amount of sedimentation. Look at the key recommendations.

- Discuss the plan and create a star chart to show the different perspectives within the Porirua community towards this structural plan.
- Who will be pleased with the reforms and who will be will not?
- Create a role-play, imagining a TV show such as Campbell Live has come to Porirua to report on the tensions as different groups in the community clash. Different people of the community are interviewed and asked to give their perspective of the change of rules and how it affects their lives. You may choose to interview members of the community to ask them their response to the changes. For example local residents, developers.
- Students could record their TV show, or make a radio broad-

cast, to present to the class.

### Activity 7: Considering options for action

In this section, students will analyse different responses and decisions that can be made in regard to protecting the harbour and catchment. Remind them that as members of the Porirua community we can help bring about change.

They will evaluate the consequences of any changes they have considered and decide on the best option to ensure any effects are positive.

Using the [template for planning action](#):

1. Identify an issue with students
2. Look at the overall vision with students; i.e. what is it that we want to achieve?
3. Plan the action: Consider what exactly needs to be done to achieve the vision. This could include several smaller projects within the larger project that either the whole class is involved with over time, or small groups within the class. Check that the action addresses the issue.
4. Consider the skills required to carry-out the action and where more information can be found.
5. Consider how people will think and feel about the planned action and how you will find this out.
6. Make some decisions: what could influence the decision on what to do? List the options and criteria in a decision-making matrix to choose the action. Criteria should include:
  - ensuring the action addresses the issue
  - resources required
  - time and learning
  - (add your own criteria as required)
7. Carry out the action.
8. Reflect on Change: Some questions may include:
  - How can we make people more aware of the issue and our action(s)?
  - Did our actions meet our vision?
  - Did our actions impact on the issue we identified?

Project ideas:

- Using the Nature Watch Ecological Restoration Database, students set up own project to monitor the health of the harbour. The monitoring database is used to record the survival, arrival, regeneration, growth and behaviour of species in habitats being actively restored.
- There are many existing restoration projects students can get involved with. Contact Greater Wellington Regional Council to find out more information about student involvement in current projects.

- Write letters to the government
- Create an awareness campaign in the community
- Clean up an area of the harbour or catchment
- Create a plan or model
- Contribute to scientific studies (e.g. mm2 project)

## So what, now what?

### Activity 8: Reflection

Allow time at the end of the study for your students to reflect on what they learnt and what their action achieved. How has this experience shaped their sense of kaitiakitanga? What would they have done differently? How has this helped them understand the challenge of sustainable management of our natural resources? What do they know about the natural ecology of the harbour and catchment that they didn't know before?