

# Activity 2: The importance of estuaries



Let's find out about why estuaries are important



## CURRICULUM LINKS

### Learning areas

#### Science: Levels 1–4

- Planet Earth and Beyond: Earth systems.
- Nature of Science: Communicating in science, investigating in science.

#### Science capabilities

- Gather and interpret data.
- Use evidence.
- Interpret representations.

#### Te Marautanga o Aotearoa

**Pūtaiao:** The natural world.

#### Other curriculum links: English

- Listening, reading, and viewing.
- Speaking, writing and presenting: processes and strategies.

### Learning intentions

#### Students are learning to:

- identify why estuaries are important for people, animals, plants and the wider environment.

### Success criteria

#### Students can:

- record their ideas about why estuaries are important for people, animals and plants.

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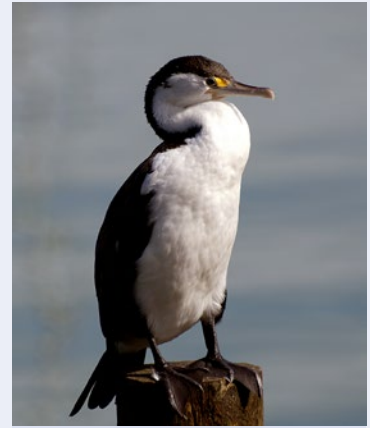
# BACKGROUND NOTES

## WHY ARE ESTUARIES IMPORTANT FOR PEOPLE?

Estuaries provide us with many different types of food, oxygen, clean water, recreation opportunities and other resources. They also protect the land from storms, cyclones, floods and large waves. Many of our coastal fisheries rely on estuaries, as they provide important habitat for spawning (breeding) and allow juvenile fish to grow.

Our estuaries are popular places where many people choose to live. Many New Zealand towns and cities were built near estuaries, such as Auckland, Thames, Tauranga, Christchurch and Invercargill.

Estuaries are also important for social, educational and cultural reasons. They are meeting places, tourist attractions, recreation areas, and places where we can pass on traditional knowledge and customs. See  *Activity 7: Estuaries and Te Ao Māori* for more information about the cultural and traditional use of estuaries by Māori.



Pied shag. Photo: Bernard Spragg


## WHY ARE ESTUARIES IMPORTANT FOR OTHER ANIMALS?

New Zealand estuaries are home to many birds, fishes, crabs, snails and other invertebrates. Estuaries provide native animals with ideal habitats and shelter for building nests, laying eggs and raising their young. Many of our native fish species need to move through estuaries at some stage of their life cycle (eg eels/tuna, kōkopu, īnanga), some marine animals visit estuaries regularly to feed or breed (eg snapper/tāmure, oystercatcher/tōrea and pied shag/kāruhiruhi) and some of our animals spend their entire lives in estuaries (eg cockles/tuangi and mudflat snails/whētiko). Our estuaries contain plentiful supplies of food for animals.

Migratory birds, such as godwits/kuaka, sometimes use estuaries to rest and find food between or during their journeys. In New Zealand, migratory birds stop over at the

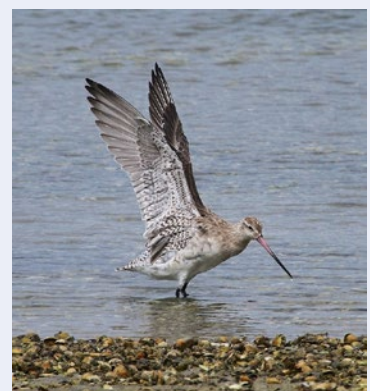
 Firth of Thames, Ahuriri Estuary and Manawatu Estuary

You can find out more about these migratory birds on the DOC website.

 Miranda's migratory birds

For further information on New Zealand's shorebirds, see the Pūkorokoro Miranda Naturalists' Trust education resource *Shorebirds of Pūkorokoro Miranda*.

 Shorebirds of Pūkorokoro Miranda



Bar-tailed godwit at Waipu Estuary, Northland.  
Photo: Rod Hay



## HOW ARE ESTUARIES IMPORTANT TO THE WIDER ENVIRONMENT?

Estuaries provide us with 'ecosystem services,' which are the benefits people obtain from ecosystems (eg nutrient cycling, primary production and resource provisioning).

The water cycle and the storage and cycling of nutrients such as nitrogen and phosphorus rely on estuaries. In addition, the water from rivers is filtered in estuaries before it goes out to sea, maintaining water quality – for example, salt marshes and mangroves filter out pollutants and sediment from the water. Carbon is locked into estuaries through the plants and muds, helping to combat climate change – ten times more carbon can be stored in an estuary than in a forest of the same size.







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**Activity 2: The importance of estuaries**  
PROTECTING OUR ESTUARIES

# LEARNING EXPERIENCE 2: IMPORTANCE OF ESTUARIES

## Resources for this activity

- Slideshow  The importance of estuaries
- Video narrated by Long Bay Primary Room 12 students  
 The importance of estuaries
- Student worksheet  Why are estuaries important? (page 8)
- Poster  Why are estuaries important? (page 9).



Focus question  
What is an estuary?

## Vocabulary

Importance, breeding, feeding, filtering, pollution, shelter, providing, storing, resources, sediment, inquiry, bird, fish, habitat, shelter, food, protection, carbon, climate, nutrients, oxygen.

## Links

To open the links throughout this resource without losing your place in the document, follow either of these steps:

- Right click on the link and click **Open Hyperlink**. Now the link will be opened in new tab.
- Hit the **Ctrl** key while you left click the link. This will also force the browser to open the page in a new tab.

Either of these methods will open the link in a new tab leaving the teaching resource open.



## INTRODUCING STUDENTS TO ESTUARIES

*Note: These learning experiences are suggestions only. Teachers are encouraged to adapt and change the material to suit their students' needs and interests.*

### Inquiry stage 1: Dive in



### Why are estuaries important?

- Discuss the importance of estuaries for people, animals, other living things and the environment.
- View *The importance of estuaries* slideshow or video to find out more about why we need estuaries.
  -  The importance of estuaries slideshow
  -  The importance of estuaries video, narrated by Long Bay Primary Room 12 students



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Activity 2: The importance of estuaries  
PROTECTING OUR ESTUARIES

## Investigating the importance of estuaries for people, birds, fishes and the environment



- Students can record their ideas about why estuaries are important for people, other animals/living things and the environment using the student worksheet *Why are estuaries important?* (see page 8). The illustrations on page 9 should give inspiration and ideas about how estuaries provide for and protect people, other animals and the environment.

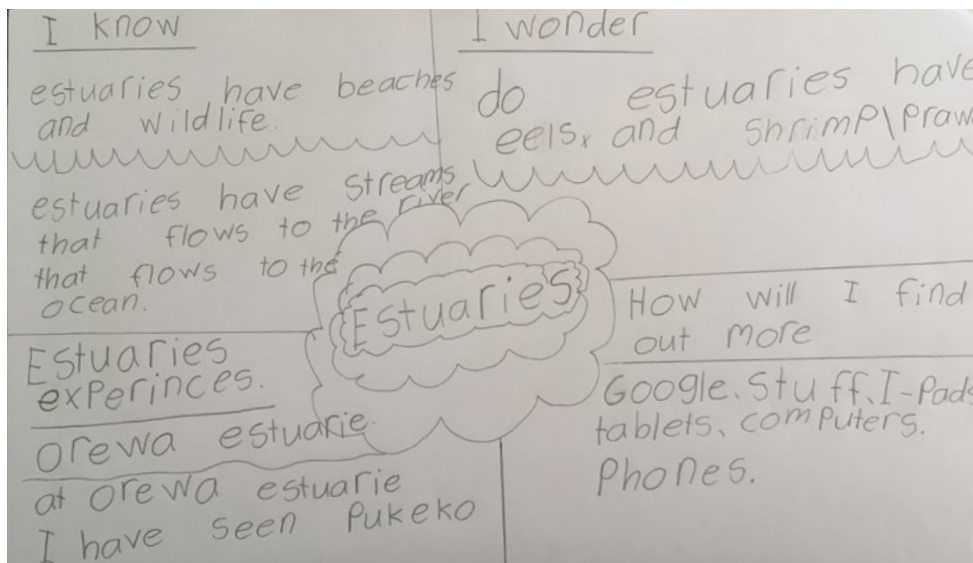
### Inquiry stages 1 and 2: Dive in and ask



## Starting or continuing a learning inquiry

To start planning an inquiry about estuaries and/or a species of their choice, students could use the *Student inquiry plan example*:

- ⊕ Printable version in *Protecting our estuaries: Introduction* (pages 18–19)
- 🔗 Google Docs version
- Innovative inquiry and curiosity is to be encouraged.
- 🔗 Other activities in this resource may support the various lines of inquiry.
- Review *Activity 1: Introducing Estuaries* and reflect on the students' recordings of their prior knowledge, experiences and wonderings from this activity.
- ⊕ *Activity 1: Introducing Estuaries*



Estuaries ideas by a Long Bay Primary School student.

- Further develop the students' questions into bigger/richer/deeper questions for inquiry to form the basis of your unit. This could be done individually for capable students or in groups or as a whole class for younger students.



## REFLECTING ON LEARNING



- Review why estuaries are important using the poster on page 9.
- View the Science Learning Hub's *Estuaries* video, where scientist Candida Savage talks about the importance of estuaries.
  - ▶ Science Learning Hub – Estuaries
- Students could summarise why estuaries are important by producing a poster, written report or presentation.

## EXTENDING LEARNING

- NIWA's webpage explores the importance of estuaries and the marine environment and their effect on human wellbeing in more detail.
  - 🔗 NIWA – Ecosystem services
- Students could also view the Science Learning Hub's *Valuing estuaries* webpage to learn more about why estuaries are important.
  - 🔗 Science Learning Hub – Valuing estuaries

## OTHER RESOURCES RELATING TO THE IMPORTANCE OF ESTUARIES

- Environment Southland's Enviroteach newsletter:
  - 🔗 *Enviroteach* newsletter
- Waikato Regional Council's factsheet:
  - 🔗 Ecosystem services in estuaries
- NOAA podcast:
  - 🔗 Diving deeper: Estuaries
- DOC brochure, which includes information about migratory birds:
  - 🔗 Ahuriri estuary bird guide
- *Two minutes on oceans* video clip by James Toomey and UNEP (United Nations Environment Programme) on 'natural capital' or the 'value' of natural assets:
  - ▶ The true value of our oceans
- NIWA's *Estuaries* education resource:
  - 🔗 Estuaries
- Landcare Research's resources on the ecosystem services of estuaries:
  - 🔗 The many uses and values of estuarine ecosystems
  - 🔗 Ecosystem services in New Zealand

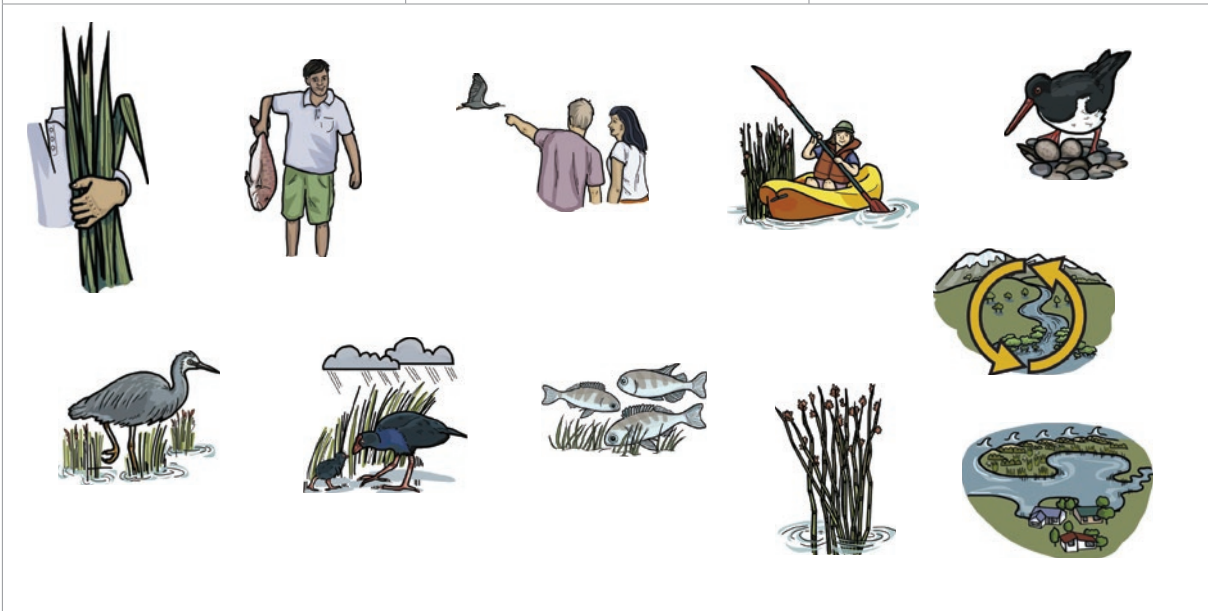




# Why are estuaries important?



For people	For the environment	For animals and other living things



Google Drawings version: Why are estuaries important?





# WHY ARE ESTUARIES IMPORTANT?

## Why are estuaries important?

For animals and other living things



Estuaries provide habitat for animals and plants



Estuaries provide shelter from storms and weather



Estuaries provide nesting and breeding areas for animals



Estuaries provide feeding areas for animals



Estuaries provide food for people



Estuaries provide tourist attractions and are places for learning



Estuaries provide other resources for cultural and traditional uses, eg plants and medicines.



Estuaries are places to relax and have fun

For the environment



Estuaries store and cycle nutrients



Estuaries clean and filter the water



Estuaries protect land from waves and floods

