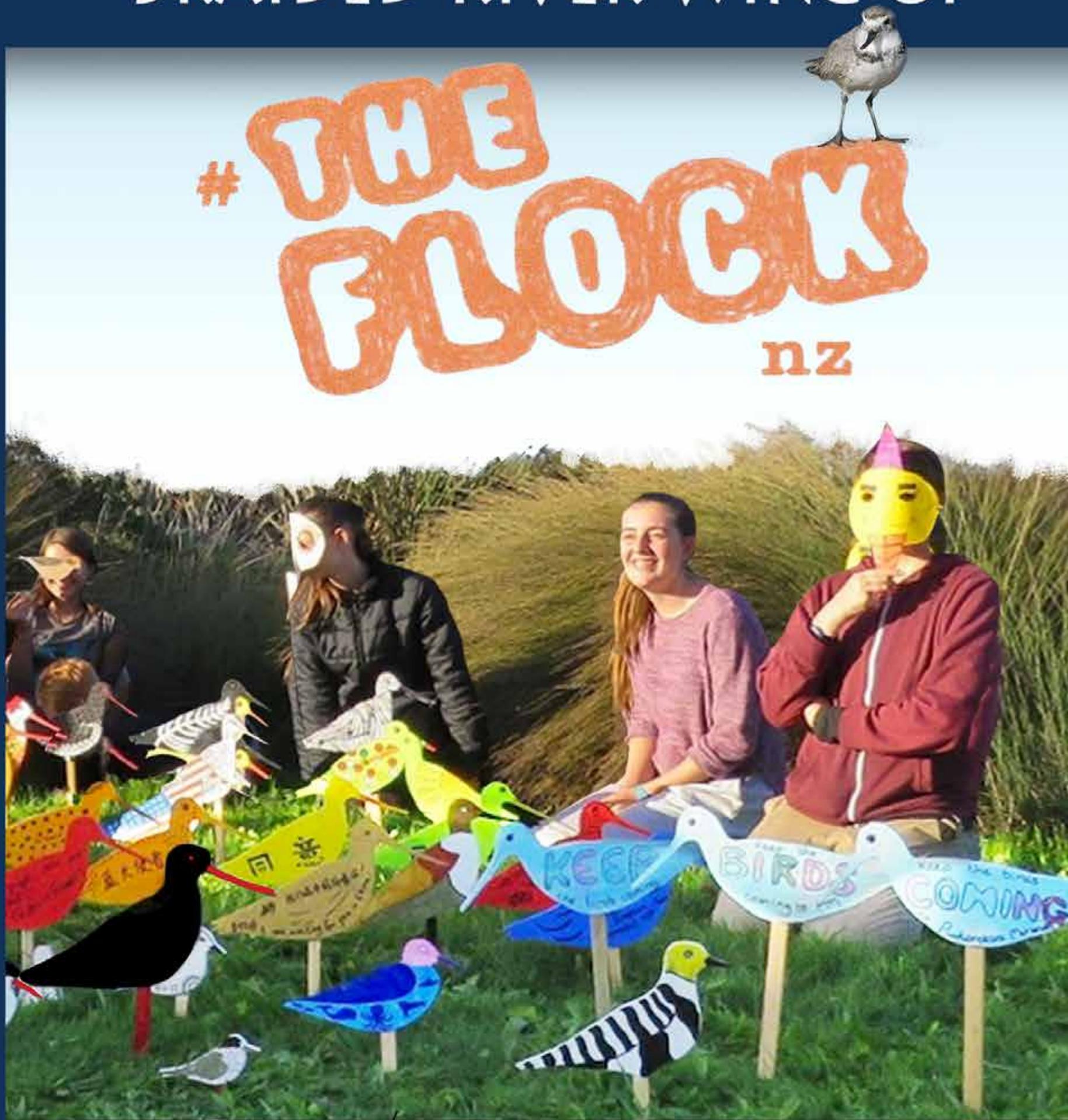


TEACHING RESOURCES BRAIDED RIVER WING OF



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PEDAGOGY: “Students require a range of learning experiences to understand and develop attitudes and values towards the environment and sustainability issues.”
- NZ Curriculum Resources, Education For Sustainability

INTRODUCTION

The purpose of this resource is to support school teachers to plan a learning programme that builds knowledge and understanding of South Island braided river birds, their iconic habitats and migratory behaviour, and the pressing issues that affect their survival in a changing world.

This document outlines some—but by no means all—of how these concepts link to NZ Curriculum, and includes resources on braided rivers, braided river birds, some of the issues that threaten them, and conservation actions. It also includes classroom activities in addition to information about making The Flock, links to additional resources, and a glossary of key terms. We also recommend you see The Department of Conservation's 2010 '[River Life Teaching Resources](#)' including teachers' notes and assessments.

Our hope is that Braided River wing of The Flock will also enable schools to develop ties with one another, as South Island schools wave farewell to nesting birds and North Island schools welcome their return to winter feeding grounds. This connection is highlighted through [BRaid's](#) association with the [Pūkoro Mirānda Naturalists' Trust](#), which created [#TheFlockNZ](#) and generously provided large sections of their teaching resources in this document.

This teaching guide was produced as part of the Braided Rivers Partnership Project through funding from the Department of Conservation Community Partnership Fund, No: CCPF2-009/DOC-261678, and the Department of Internal Affairs Environment Lottery WW1 Commemorations, Environment and Heritage Fund, No: R-LEH-2016-25747



Photo: Steve Attwood

Potts River, a tributary of the Rangitata River (background), is one of the South Island braided rivers that provide specialist bird breeding habits in Spring & Summer.

RESOURCE FRAMEWORK

This resource provides a learning context of braided river birds and their habitats offers students and teachers:

- An approach that takes into account global and local influences on our unique birds;
- An emphasis on the future, the dynamic nature of braided rivers, and the capacity to choose and shape preferred futures;
- An opportunity to explore themes such as biodiversity, interdependence, change;
- A focus on cooperative learning, decision-making and action, and shared responsibility;
- An emphasis on critical thinking and communication;
- An opportunity to take action for the environment that helps ensure these birds continue to be part of the future.

KEY COMPETENCIES AND VALUES

This learning context provides multiple opportunities for development of the five key competencies and the values of the New Zealand Curriculum when explored, modelled and encouraged:

- Thinking
- Relating to others
- Using language, symbols, and texts
- Managing self
- Participating and contributing
- Self-management and relating to others

Compare students' behaviour to the birds' adaptations, feeding behaviour, abilities, and resilience during migration. Your school values can be reinforced through articulating these within this context, discussing the need to be respectful and sensitive to the environment, and to consider and take responsibility for special places.

KEY CONCEPTS

Everything is interconnected

Braided river birds are part of fragile and complex ecosystems. Changes in any of the links within and between these ecosystems will have a flow-on effect.

Species adapt to the environment

The birds have particular features and adaptations that allow them to migrate to and thrive in habitats unique to New Zealand.

Global citizenship and shared responsibility

There are environmental, social, economic, and political links that influence people and the natural environment. We can all participate in taking responsibility for and have a positive influence on our land and water.

Biodiversity loss is a choice

We can choose through our actions to safeguard and improve habitats.



Most of these organisms have evolved to live and breed exclusively in braided rivers. Many are now endangered. Click on the image to find out what these are (DOC website).

SUBJECTS

THE ARTS

The Flock is designed to communicate a range of concepts through visual art. Students will develop an understanding of how The Flock tells the story of braided river birds. Locating The Flock in prominent locations is a form of public art that, through visual narrative, will raise awareness of the problems faced by migratory braided river birds. Without warning, the Flock will vanish from one location and reappear in another, just as the real birds do as they try—and often fail—to find a safe place to nest. We anticipate that some of The Flock will be damaged or stolen, reflecting the real-world dangers the birds face. We will use cut-outs of feral cats and mustelids stalking The Flock to demonstrate some of these dangers.

Students will be able to use a range of materials and creative processes to decorate the birds. Students will also be able to participate in the decision making process of where The Flock will be displayed in order to tell their story, and how stories about problems the The Flock face can be communicated through different forms of media.



SUBJECTS

THE ARTS

Level 1-2

- Share ideas about how and why their own and others' works are made and their purpose, value, and context
- Explore a variety of materials and tools and discover elements and selected principles
- Investigate visual ideas in response to a variety of motivations, observation, and imagination
- Share the ideas, feelings, and stories communicated by their own and others' objects and images

Level 3-4

- Explore some art-making conventions, applying knowledge of elements and selected principles through the use of materials and processes.
 - Describe the ideas their own and others' objects and images communicate
-

SOCIAL SCIENCE

Through learning about BRaid and Pūkorokoro Miranda and the partnerships with local, national, and international groups and organisations, students will understand that people have different roles and responsibilities and can work together towards a common goal. They will understand how places influence people and people influence places and that people view and use places differently.

Treaty of Waitangi

Students will learn that braided river birds are taonga species to Māori, develop an understanding of the concept of the mauri of waterways, and how this concept is linked to ecology and healthy waterways.



Students from Mangatangi School, Firth of Thames in the North Island showing off their contributions to The Flock.

SUBJECTS

SCIENCE

Nature of Science: students will extend their knowledge of birds and their habitats through research and exploration.

- They will build their language and understanding of the ways that the natural world of braided river birds can be explained and represented
- They will develop their own questions leading to investigations and possible explanations using resources
- Students will make the connections with their learning about the birds and the issues they face, and take appropriate local action. This context allows opportunities to learn about the living world.

Level 1-2

Investigating in science:

Students will extend their experiences and personal explanations of the natural world through exploration, play, asking questions, and discussing simple models of migratory birds.

Communicating in science:

The Flock project will build their language and develop their understandings of the many ways the natural world can be represented.

Participating and contributing:

Explore and act on issues and questions that link their science learning to their daily living: braided river birds are declining because of habitat loss and introduced predators.

Life processes:

Students will recognise that braided river birds have certain requirements to stay alive.

Ecology:

Braided river birds are suited to particular habitats. Students will recognise that the wrybill, black-fronted tern, black-billed gull, and other river birds have particular features that help them live in these habitats. They will learn that these birds migrate to the North Island or the coast at particular times of the year.

Evolution:

Students will recognise that birds can be grouped depending on particular features.



Level 3-4

Life processes:

Students will learn that braided river birds have complicated life processes that involve migration.

Ecology:

Students will be able to explain the reasons the birds have adapted to their habitats and how they respond to changes in seasons. They will be able to consider both natural and human-induced environmental changes and the impact these may have on these birds and their habitats.

Evolution:

Students will understand that plants and animals are able to be placed in scientific groups. They will understand the difference between indigenous, endemic, and introduced. They will know that adaptation is an evolutionary process that means the birds are suited to their habitats.

SUBJECTS

EDUCATION FOR SUSTAINABILITY

“It is for us to care for and look after the environment to ensure its wellbeing, in doing so we ensure our own wellbeing and that of our future generations.”

Education for sustainability includes learning about:

- the environment—water, land, ecosystems, energy, waste, urban living, transportation
- the interactions between the natural environment and human activities, and the consequences of these
- the choices and actions we can take to prevent, reduce, or change harmful activities to the environment

The health of our waterways, competition for water—especially in Canterbury—biodiversity loss, and climate change are key sustainability issues. The Flock project enables students to explore these issues and to take actions to prevent harmful activities to the environment.

[The following is taken directly from the NZ Curriculum website:](#)

New Zealand’s national curriculum focuses on 21st century learning, ensuring learners are equipped to participate in and contribute to their own society and the wider world. An important aspect of this is encouraging students to consider significant future-focused issues such as sustainability.

The future-focus theme of sustainability is evident throughout The New Zealand Curriculum. It is integral to the vision, principles, values, and key competencies, and provides relevant and authentic contexts across the eight learning areas.

Structuring learning around a unifying theme such as sustainability provides opportunities for students to make connections between learning areas, competencies, and values. It requires teaching and learning approaches that draw on all elements of effective pedagogy and focuses on empowering students to take action for a sustainable future.

Students will be encouraged to value: “ecological sustainability including care for the environment”. In exploring environmental issues, people’s interests in the environment, and actions for a sustainable future, students will have many opportunities to:

- *learn about their own values and those of others develop their ability to express their own values*
- *explore with empathy the values of others*
- *critically analyse values and the actions based on them*
- *discuss disagreements that arise from difference in values and negotiate solutions*
- *make ethical decisions and act on them*

ENGLISH, MATHS, STATISTICS

Because this is an integrated learning context, The Flock can be woven into many other aspects of the curriculum using the resources provided on the following pages. Examples include:

English: [stories about birds by children](#)

Maths: [‘Winging it’, using maths to examine how wings work](#)

Statistics: [Wildlife Counts](#)

RESOURCES

BRAIDED RIVERS

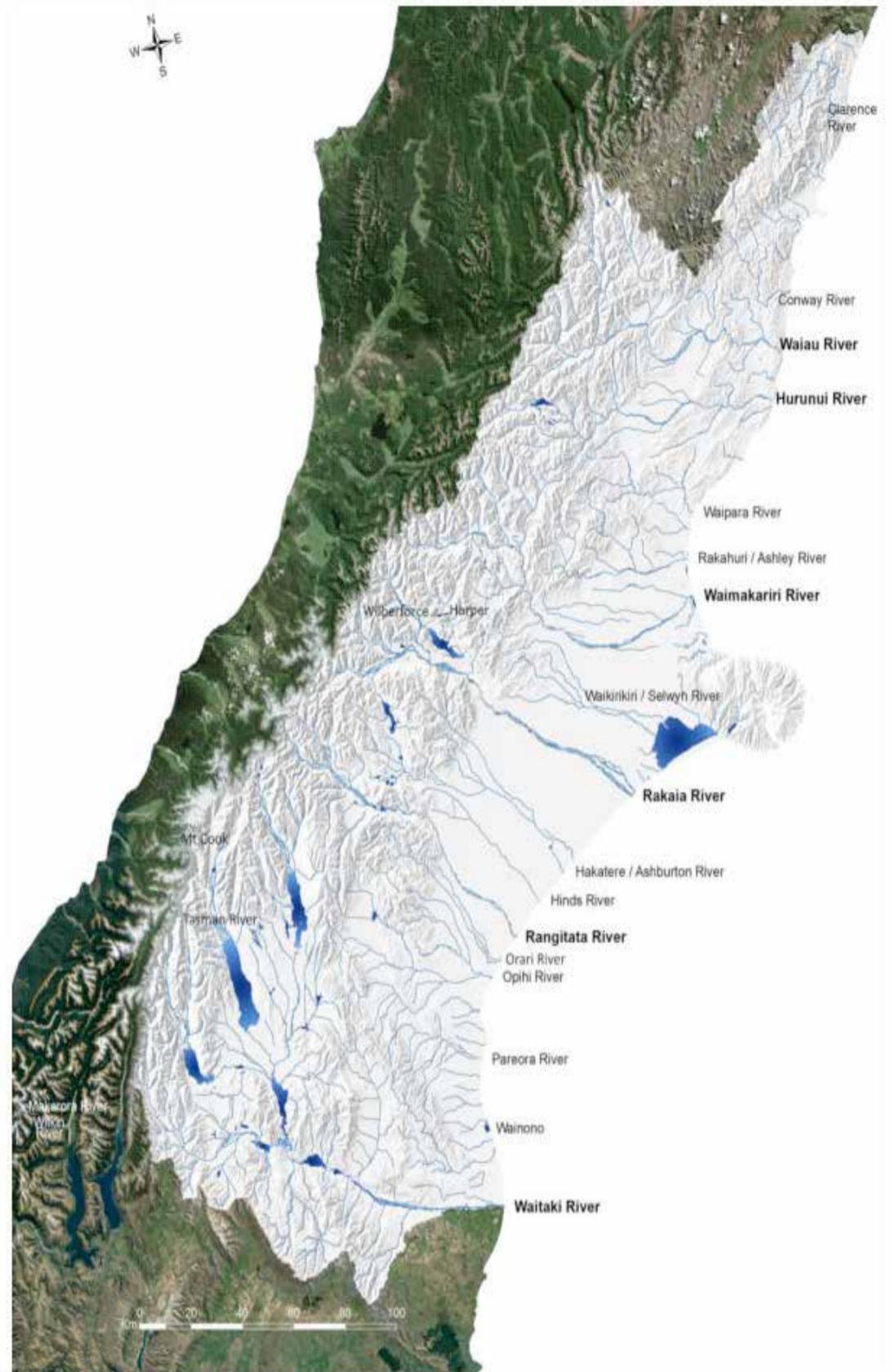
Braided rivers differ to other rivers because they have many shallow channels or 'braids' flowing around islands of gravel. This provides a much larger area of shallow river margins where the food-chain starts: insects accumulate, small fish abound. This is where river birds love to feed. The islands and edges of braided rivers provide nesting grounds for these and other specialist braided river birds. While braided rivers are relatively common in New Zealand, braided rivers are globally rare ecosystems. They exist only where a very specific combination of climate and geology allows rivers to form ever-changing and highly dynamic 'braided' channels across a wide gravelly riverbed.

Some 59% of New Zealand's braided rivers are in Canterbury, with a catchment of over 140,000ha. Indeed, the entire Canterbury Plains was formed by sediment and gravel carried from the Southern Alps by braided rivers.

How braided rivers formed the Canterbury Plains

As glaciers came and went over the past 3 million years, they ground through the Southern Alps, creating huge volumes of moraine gravels and sediment. With precipitation as much as 12 metres a year at high altitudes thanks to the powerful north-westerly winds, fast flowing rivers carried the gravels and sediment to the coast east of the Main Divide, eventually depositing so much into the ocean that deltas formed and the coastline grew eastward. Thanks to plate tectonics, the relatively young mountains were uplifted at some 20mm/year. They were also eroded around the same amount, providing an endless supply of sediment. Over time, the deltas joined into alluvial fans until they eventually created the giant 'megafan' that we now call the Canterbury Plains. The process continues today, with rainfall stripping an estimated 10,000 tonnes/km² annually from the mountains.

[Learn more about braided rivers here.](#)



Canterbury's braided rivers: click image to enlarge

RESOURCES

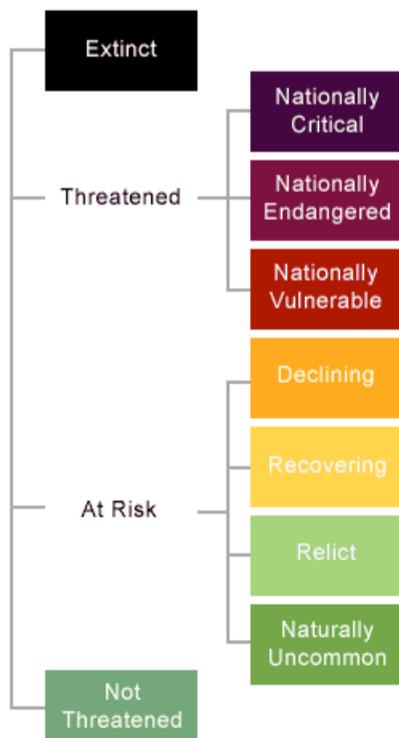
BRAIDED RIVER BIRDS

Over 80 species of river birds are found along braided rivers from the mountains to the sea. Many are threatened or at risk. Some have evolved to breed **only in braided rivers**. They are endemic to New Zealand; that is, they are found nowhere else in the world. These birds form the **Braided River wing** of *The Flock*:

- Pied stilt
- Black stilt
- Black-billed gull
- South Island Pied Oystercatcher
- Black-fronted tern
- White-fronted tern
- Banded Dotterel
- Wrybill

[Find out more about each of these birds here](#) Resources include:

- Short videos of the main braided river birds
- Description of each bird
- Their Māori name
- Their scientific name
- Which braided rivers they nest in
- Whether they are at risk or threatened
- What kinds of threats they face
- What conservation activities are being done to help them
- Links to other websites with information and photos



Click the box at left to find out the difference between 'threatened' and 'endangered'.

RESOURCES

BRAIDED RIVER ECOLOGY

Because braided rivers are globally rare, their ecologies are equally rare, and they are extraordinary biodiversity hotspots. The life in and around them is highly specialised, and their ecological relationships are complicated by the fact that braided rivers stretch from the highest peaks in the mountains to the coast. They travel through alpine tussocklands, forests, dairy farms and sheep farms, exotic tree plantations and vineyards, narrow gorges of ancient Torlesse greywacke and not quite as ancient limestone, down through coastal plains, beside roads, through towns, coastal wetlands and through dunes until finally reaching the sea. A huge variety of birds, fish, reptiles, plants, and fungi, have adapted to these challenging and dynamic environments defined by channels of water weaving between temporary islands of gravel.

The evolution of New Zealand's ecology

Some 93% of the New Zealand continent, sometimes called [Zealandia or Tasmantis](#), is underwater. Most if not all of the land we see today was submerged until around 20 million years ago. As [tectonic forces](#) pushed the land above the surface of the ocean, isolated as it was from other land masses, the only life that took hold were the plants and animals carried ashore by waves, blown by winds, or by flying from Australia, South America, Pacific Islands, and (then largely ice-free) Antarctica. As a result, our only native terrestrial mammals are bats. Without herbivorous mammals to graze plants or predatory mammals to eat the herbivores, ecological niches were instead filled with birds and invertebrates like the [Robust Grasshopper \(pictured below\)](#) which lives **only** in braided rivers..and is really a 'rock-hopper'. When humans introduced mammals, these ecosystems were disrupted and extinctions soon followed.

[Learn more about New Zealand's unique ecology from the Science Learning Hub \(includes short video\).](#)

Today, on the plains, away from the coast, only the braided rivers still have indigenous components largely as they were thousands of years ago—despite having received little protective management to date. The most obvious component of these native ecosystems is the birds. Their populations are declining and several species are at now at risk of extinction. The reasons are outlined in Page 14 Threats.

Why are braided river birds important?



Every species plays a role in its ecosystem: as a food source, a pollinator, a predator, and so on. When a species is lost, the ecosystem—and the free services it provides, like clean water—is affected, with unpredictable and sometimes disastrous consequences. And once a species vanishes, the effects of its loss cannot be undone. It is well understood that without apex predators, healthy ecosystems deteriorate. In ecological terms, this is called a 'trophic cascade'. In New Zealand, birds evolved to become apex predators. Introduced predators like rats, cats, hedgehogs, ferrets and stoats, which are now devastating them, can't replace the vital role that birds play in braided river ecosystems. Conversely, protecting braided river birds and restoring their habitats is an important part of restoring and maintaining healthy waterways.

[Find out more about braided river ecology here.](#)

RESOURCES

MIGRATION

Every spring, braided river birds fly to the South Island's braided rivers to breed. Some come from the coast, while others fly from the North Island or across the ocean from Australia, Vanuatu, and Fiji. They've been making this journey for millions of years.

However migration in animals is not completely understood: what triggers it, what influences departures and arrivals, and why birds choose to travel along certain flyways. We do know that it is related to the axial tilt of the Earth, which influences the seasons, and in turn the availability of resources: food and nesting locations.

As winter approaches, and the availability of insects and other food resources drops in the South Island, some birds like wrybill move to the North Island. Others such as black-fronted terns move to the coast so they can catch food at sea. Escaping the cold is a motivating factor but many species, such as the black stilt, can withstand freezing temperatures as long as an adequate supply of food is available.

Migration can be triggered by a combination of changes in day length, lower temperatures, changes in food supplies, and genetic predisposition.

Migrating birds can cover thousands of kilometres in their annual travels. Between leaving New Zealand in March and returning in September, the tiny wrybill may fly from the South Island to Pūkoro Miranda in one flight of 1000km. Birds often travel the same course year after year with little deviation (depending on weather).

The ability of migratory birds to navigate and orientate themselves during migration is much more complex, and may include both endogenous (internal) programs as well as learned behaviour. Birds appear to navigate using a variety of techniques, including navigation by the stars, sensing changes in the earth's magnetic field, smell, and possibly processes involving spectrums of light, electron excitation, and constant recalibrations!

Migration is often concentrated along well-established routes known as flyways, which are shaped by geographical, ecological, and even meteorological factors. For some birds these flyways may be a series of linked habitats —breeding sites, wintering sites and refuelling sites during migration—that give birds the resources they need throughout their annual cycle. All are essential: to lose even one would threaten a bird's survival.

[Find out more about New Zealand bird migration here.](#)



RESOURCES

THREATS TO BRAIDED RIVER BIRDS

- [Weeds like gorse, broom, and lupins](#) invading braided rivers, forcing birds to nest on the remaining weed-free low-lying flood-prone areas
- Weeds are also changing the character of braided rivers by choking the ‘braids’, forcing the water to flow into deeper, narrower channels. The birds can’t feed and the rivers are far more flood-prone
- Weeds are not the only thing causing habitat loss. From 1990-2012, in Canterbury alone an astonishing 11,630ha of braided river margins/floodplain (see [‘defining a braidplain’](#)) was converted to intensive agriculture
- Introduced pests like [stoats, rats, hedgehogs, and cats](#) are devastating colonies
- [Taking water from our rivers](#) for irrigation and electricity generation causes water levels to drop. The gravel islands where birds once nested become connected to riverbanks, allowing predators easy access to nesting birds. Too little water also means not enough food for chicks
- [Damming rivers](#) irrigation and hydro-electricity production artificially control the water flow, destroying the natural ‘braiding’ process of braided rivers
- [Careless people](#) are a big problem. 4WDs, shooters, and walkers allowing their dogs to run free disturb nesting birds. When they fly off their nests, the chicks die quickly when its too warm or too cold, and predators can easily attack them. In 2015, people stole thousands of eggs from birds’ nests along the Lower Waitaki river-mouth
- [Climate change](#) is multiplying these problems and causing new problems

[Find out more about all threats here](#)

CONSERVATION ACTIVITIES

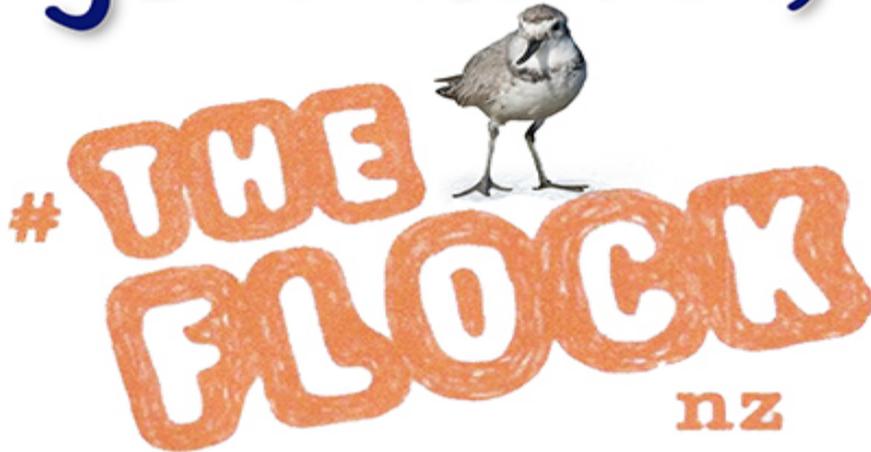
New Zealand has signed the [International Convention on Biological Diversity](#), which includes a mandate to prevent the decline in indigenous species. Unfortunately, many species including braided river birds are continuing to decline. From 2008-2012, for example, the population of black-billed gulls, which are endemic to New Zealand, declined 70%.

The responsibility to protect biodiversity falls to national and local government agencies including the Department of Conservation (see for example [Project River Recovery](#)), and regional and district councils. Many non-government organisations (NGOs) also try to protect biodiversity including [Forest & Bird](#) and the [Ornithological Society of New Zealand](#). [BRaid](#)—braided river aid—is a Charitable Trust set up specifically to help braided river birds.

Because braided rivers traverse so many different terrestrial habitats from the mountains to the sea ([see Page 9](#)), no single conservation strategy can protect the birds. They are often forced to move from one river to another to find a nesting spot. And each new location brings with it different threats. For this reason, the BRaid [birds](#) and [rivers](#) web pages feature different conservation activities being undertaken on different rivers, from clearing weeds and trapping predators, to the [kaki captive breeding programme](#). But it’s often the case that we don’t know where these birds are. So BRaid has launched its Braided Rivers Partnership Project to encourage people who live and work near braided rivers to report seeing the birds, and to help protect them. Find out more about the [Partnerships Project here](#).

[The Flock Project](#) has been designed to draw attention to the threats faced by these unique birds, so that communities and people of all ages can do more to protect them.

Get creative join the fun, & help make



Every spring, **migratory birds** fly to the South Island's **braided rivers** to breed. Some come from the coast, while others fly from the North Island or across the ocean from Australia & Fiji. They've been making this journey for millions of years, but because of **predators & habitat loss**, some are **close to extinction**.

Pukorokoro Miranda Shorebird Centre in the North Island, are creating **The Flock** to help spread the message about the threats facing them, and...



Get your school, business, club or community group involved!

Here's how it works...

Just like real braided river birds searching for a safe place to nest, **The Flock** will pop up overnight in towns and places near braided rivers, then disappear...only to reappear somewhere else. **The Flock's** movements will be shared through social media, along with its inevitable losses as some fall victim to theft and damage, just like the real birds as they struggle to find a place to breed and raise chicks.

Everyone can help!

Right now, we're creating **The Flock**. We need help with:

1. **Making cut out birds for decorating** - plywood or corflute needed, along with cutting skills
2. **Assembling and colouring the birds** - paint, write a message, knit a jersey, add **bling**...
3. **Host The Flock** - if you have an idea for a good spot (the more prominent the better), or can organise a spot, we'd love to hear from you!

-  See: www.braid.org.nz to...
- discover what birds belong to the **braided river wing** of **The Flock**, and where they nest
 - download templates to cut out **The Flock**
 - find out where you can deliver completed birds
 - download learning resources for schools



RESOURCES

CLASSROOM ACTIVITIES

Note: these activities have been taken directly from the [Pūkorokoro Miranda Naturalists' Trust Education Kit](#) and adapted to suit braided river habitats. The first activity uses estuaries because of the limited resources available for braided rivers. The learning principles are the same, and relevant to braided river birds as they also depend on estuaries.

Use the [estuaries food web from the Encyclopaedia of NZ](#) and create cards for each entity. Use wool or string to link the elements and animals, inviting each student “food web character” to introduce themselves (who are they?).

Think about how [each character is connected](#) and pass the wool between to signify this.

Reflection: What happens if one “character” from your web is removed? What could cause that?

Now consider the epic journeys that these migratory shorebirds take and how, by doing so, they connect ecosystems across great distances. What might cause the links to break?

Ecology...or Economy? What's best for New Zealand?

The rapid growth of the dairy industry has become a much-argued environmental issue in New Zealand. This is particularly true in Canterbury, where river water quality has declined rapidly in the past few decades. Some of these issues are explored on the [Ministry for the Environment website](#). **Do you think it's more important to have clean water or more dairy farms? Or is there a way to have both?**



Photo: Linda Laing

How many black-fronted tern chicks can you see? Do you think you'd see them driving on the river in a 4-wheel drive? What if they couldn't fly yet? How would they escape from cars and dogs?

Global issues activity

Imagine if... braided rivers stopped being 'braids' and became like normal rivers?

- How would this affect the birds?
- What other changes might occur?
- How will people be affected?

Imagine if... people worked together to stop taking too much water from braided rivers?

- Who would need to be involved?
- What would be the benefits?

Imagine if... climate change meant that the oceans become too warm and too acidic

- How would this affect the birds?
- What other changes might occur?
- How will people be affected?

Imagine if... something was in the wrybill's flyway (for example, wind turbines) stopped them flying between the North and South Islands?

- What could people do to prevent this?

Imagine if... Weeds increased even more on our braided rivers?

- What would the impact be on the birds breeding?
- What other changes would take place?
- What could people do to change this?

How can we look after/value our natural spaces as well as be productive? (Extension: Use the above scenarios above to place students in the various roles of people and animals—eg Māori, farmers, reserve managers, industry developers, fishers, etc.) Consider the scenarios above and see if you can make links with your own lifestyle and what is happening in these significant habitats. (For example, think about where your food and clothing and electronics come from).

Reflection

What are the big issues facing braided river birds?

- Thinking about the life cycles of these birds, what could go wrong if temperatures changed (internal triggers to migrate, food supply not available at the right time)?
- What are reasons/influences this might happen?
- What actions can we take now to help?

Making choices: a vision for the future

- How can this new knowledge be used in a way that is relevant to your community?
- What local groups are working towards healthy ecosystems in our place?
(land-care groups, stream-care groups, Department of Conservation programmes, Enviroschools)
- In what ways can we change our behaviour so that there is less impact on the natural environment?

Class brainstorm

- What does caring for our environment mean?
- What could we be doing if we were "Caring for Our Environment?"
- What would this look like?
- How would you feel if you were caring for your environment?
- If we were going to "care for the shorebird environment" what could we do?

RESOURCES

CLASSROOM & HOME ACTIVITIES

Possible actions and ideas for further learning:

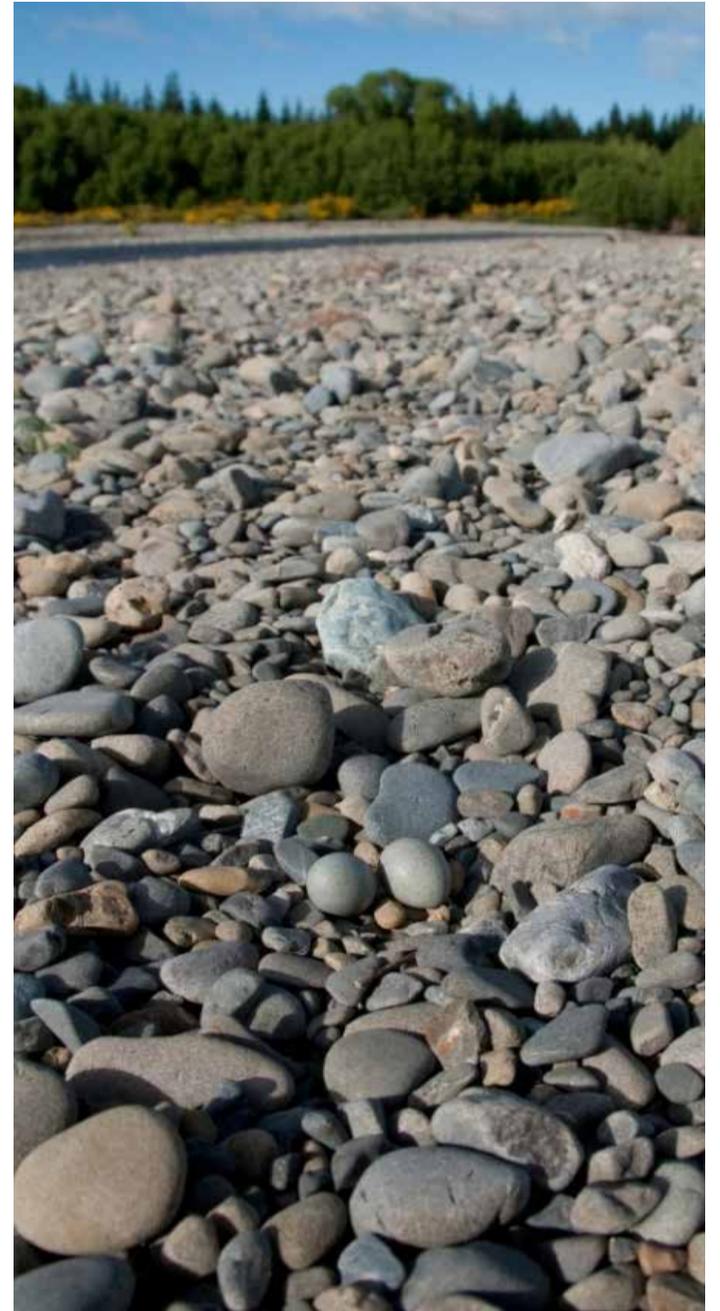
- Raise awareness of issues and the importance of natural ecosystems through **The Flock**
- Write an article, take photos, and then send to BRaid to be published in their newsletter or online (manager@braid.org.nz)
- Create brochures about river birds ([see examples here](#))
- Fund a predator control programme near you
- Become involved in a local restoration programme
- Reduce waste at school and home
- Stop using plastic bags
- Conserve water at school and home
- Reduce chemical usage—consider what cleaning products are used at school and at home
- Reduce fossil fuel use (consider your travel and think about how you can reduce use of fossil fuels)
- Buy local food, grow your own, and share the surplus

FOLLOW THE RIVER CARE CODE

Riverbed birds nest between August and February and need your special consideration during this period. So please...

- Keep clear of nests and watch out for eggs and chicks. They are hard to see and very fragile
- Be aware of birds you have disturbed. Move on within five minutes so that birds can return to their eggs and chicks or they will die
- Avoid driving any vehicle on riverbeds. Vehicles unsettle birds and run over eggs and chicks so park on the bank and walk to your destination
- Keep dogs on a lead, or strictly to heel from August through to February. Dogs running loose on riverbeds can scare away birds and destroy eggs and chicks
- Boats disturb birds and wash away nests. The speed limit for boats is 5 knots within 200 metres of the bank. The [NZ Jetboat Association](#) can supply more information about jetboating in rivers
- Obtain any necessary resource consents from regional councils for river bed works. Discuss with Department of Conservation staff about minimising the impact of activities on river birds

**Above all...respect braided riverbeds.
Many plants and animals need your help!**



Can you spot the wrybill's nest?
Imagine if you were in a 4-wheel drive.
Would you see it then?

PLEASE don't drive on us



We rare and very endangered **black-billed gulls** and **wrybills** nest in the stones, and our chicks can't fly away when you drive towards us. Please **observes the signs and keep away** and please **keep dogs on a lead**.

Ashley-Rakahuri Rivercare Group



Department of
Conservation
Te Papa Atawhai



Photo: Steve Attwood

Black-fronted tern chicks

RESOURCES

ONLINE RESOURCES THAT COULD ADD FURTHER DEPTH AND BREADTH TO STUDENT LEARNING AND UNDERSTANDING

- Select a river near you [& download the fact sheets](#) (scroll down the page to see the lists)
- [DOC Comprehensive educational resources](#) based on Mackenzie Basin rivers
- [Life on a Braided River](#) (DOC PDF brochure)
- [Celebrating Biodiversity in the Hurunui District](#) (24Mb PDF) written by children (extracts are at the end of this resource)
- [Project River Recovery](#) (DOC website)
- [New Zealand Birds online](#) (fantastic resource for identifying birds)
- [Miranda Shorebird Centre field trip](#)
- [Meet the Locals: DOC video on the Kaki recovery programme](#)
- [Miranda Shorebird Centre video](#)
- [New Zealand Curriculum: Education for Sustainability](#)
- [Science Learning Hub: Estuaries and Farmland runoff](#)
- [Science Learning Hub: Living World Life Cycles](#)
- [Science Learning Hub: Flight](#)
- [Games for Learning \(inc. Aqua Republica, a water resource management game\)](#)
- [Future Thinking Tools](#)
- [Wading Birds](#)
- [Estuaries](#)
- [‘Winging It’ Maths using wing structure to predict strength and durability and use](#)

GLOSSARY

Some of these terms are not in this resource, however students are likely to find them as they explore some of the links.

Biodiversity: biological diversity, the diversity of all living things in a place.

Bill: also known as beak, or rostrum—an external anatomical structure of birds which is used for eating, probing for food, and for grooming, manipulating objects, courtship and feeding young.

Braided riverbed: A braided river flows in multiple, mobile channels across a gravel floodplain. The channels repeatedly branch and re-join creating an interwoven pattern of low islands and shallow bars.

Chenier: a beach ridge resting on silty deposits which has become isolated from the shore by a band of tidal mudflats. The Miranda- Kaiaua cheniers are first formed as sand and cockle-shell bars on the foreshore or intertidal flats.

Ecosystem: a system, or a group of interconnected elements, formed by the interaction of a community of organisms with their environment.

Endemic: specific to a country, only naturally found here. eg the wrybill.

Endogenous: (endo= within; genous=genes), literally 'within the genes', but the terms generally just means something that is internal not external.

Flyway: The routes that shorebirds travel along on their annual migration are called flyways. A flyway is a series of inter-linked habitats broadly defined as the migration route of a population, species, or group of species of birds, between a breeding area, through the staging sites and non-breeding area.

Forage: search for food.

Fresh: a high water flow through a braided river, which 'refreshes' the river.

A large 'fresh' can fill a braided riverbed from bank to bank, so that for a short period there are no braided channels. It is not considered a 'flood' unless it breaks the banks of the wider braided river channel.

Habitat: the place or type of place where a plant or animal naturally or normally lives or grows.

Hide: area/structure built to observe the birds without them observing you.

Intertidal: the area of the foreshore and seabed that is exposed to the air at low tide and submerged at high tide, ie the area between tide marks,

Introduced: Not originally from here, brought here from another country, native to another

Main Divide: refers to the area of the Southern Alps that divides the water catchments of the eastern side of the island from those on the west coast. The Main Divide also forms the boundary between the Canterbury and West Coast Regions

Migratory: moving from one place to another at particular times of the year.

Native: native, belonging naturally. (A wrybill is endemic and is also native. A godwit is a native but is not endemic because it occurs in NZ but also other countries).

Native: species can be either **endemic** or **indigenous** (found both within the region and elsewhere), for example, South Island Pied Oystercatcher.

Phototactic: Moves in response to light (negatively phototactic = away from light).

Plumage: a bird's feathers, which may change at particular times of the year.

Roost: birds resting or sleeping.

Salt marsh: coastal flats exposed at low tide and at least partially flooded at high tide, so only salt resistant forms of vegetation can grow there.

Shorebirds: Also known as waders, feed, rest and preen on intertidal areas or on the fringes of freshwater wetlands.

Waders: Also known as shorebirds, feed, rest and preen on intertidal areas or on the fringes of freshwater wetlands.

Black Fronted Tern

By Celine Barnes
Age 10



Photo by: J Van Hal



Photo by: J Van Hal



Photo by: Johnathan Hide

MY DRAWINGS...



Key:

- Hurunui area
- Main Road
- Waiau
- Waiau River
- Where the birds are

This photo is of a middle aged Black Fronted Tern

This photo is of a 2 month Black Fronted Tern!

Photo's by: Jonathon hide

What the black fronted Terns look like!

The Black Fronted Tern looks like a small sea gull. It has a black head and orange beak. His feet are also orange. The rest of him is white and fluffy. His beak is good for turning over rocks and finding food!



Photo by: Angus Moko

Black Fronted Tern Facts

Population:
There are between 5-10,000 individual Black Fronted Terns in the Waiau river. The population has declined a lot since more and more people have come to live in Waiau and use the river

Conservation project:
People in the Waiau community have been putting posters around about the Black Fronted Tern and other native river birds. Waiau School have drawn pictures which are on the posters. Adults have also been setting traps to kill the predators.

Food:
During the breeding season Black Fronted Terns feed on emerging nymph and subimago mayflies and stoneflies or small fish or in nearby fields and river flats on earthworms, grass grub larvae and skinks. After breeding, most birds move to the coast where they feed over wet pasture on earthworms, especially during rough weather.

Photo By: James Graham



Where the Black Fronted Tern live!

The Black Fronted Terns live on the banks of the Waiau River. They breed near the river so people have to be careful where they stand. They find food at the end of the Mason River. The Mason River flows into the Waiau River.



Photo by: Charlotte MCarthy

WRYBILL

Profile

The male has a white forehead and pale grey crown, back of the neck, back, wings and tail and a white throat, breast, belly and rump, with a thin black band across the breast.

This band is thinner in the female, and much less distinct in both genders in the non-breeding season. The grey head and the crown

is present in the males but not the females.



Q:What are their chicks called?

A:I presume you mean the wrybill?Just chicks-special name.



Q:What are their predators and what is being done to protect them?

A:Feral cats, stoats and weasels and hedgehogs. Putting out traps to trap the predators so the predators can't attack the birds.

Q:What is their population?

A:4500-5000and sadly declining. This is thought to be due to the damage of the habitats so there is nowhere to breed.

Q:Can it and does it go to sea?

A:No only on land.

Q:Where are they found?

A:They're found in magnificent New Zealand. They come to breed down in the Otago and Canterbury regions and head back up to the North Island to migrate.

Q:What can we do to help them?

A:When you go out to the rivers keep your dogs on a leash and pick up rubbish if its not yours and watch where you step because the bird eggs look like stones.

Q:What can we do to get them into the least concern area?

A:The wrybill breeding area has contracted by around 50%over the last 100 years. Our focus is to assure that the present breeding area does not contract any further. Getting them back to former sites will not be easy, as they nearly always return to breed where they were they born.

Credits

- The Ashley River Care website [the interview].
- Wrybill Wikipedia encyclopedia, the internet.
- Wrybill Images internet.

If you want to learn more about the magnificent wrybill you can go to the websites above and the website for the Ashley River Care is

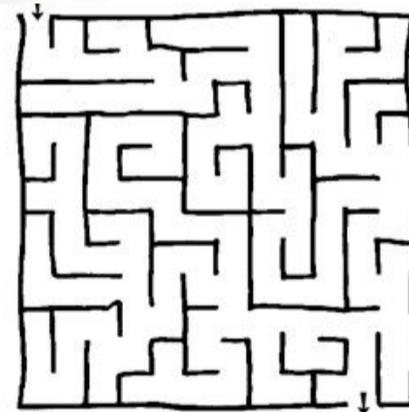
Www.ashleyrivercare.org.nz



Facts

- The Wrybill is the only bird in the world to have a curved beak.
- Their beak is curved 20 degrees to the right.
- Their beak is curved for flicking up stones to get little fish like the mudfish and white-bait.
- Their nick name is the master of disguise.
- When they flick up stones they can do it 100 times per minute.
- Their breeding season lasts through from December to February.
- The wrybills scientific name is Anarncus Frontalis and their Māori name is ngutuparore.

Puzzles



Help the Wrybill mum and dad get through the cool maze to find the baby wrybill.

What is the wrybills favourite programme?

The Bill Classics.

By Bradley White

Banded Dotterel Facts

By Ella Scarlet
Age 10



Steve Attwood



Banded Dotterel
photo gallery



Steve Attwood

Banded Dotterel Population

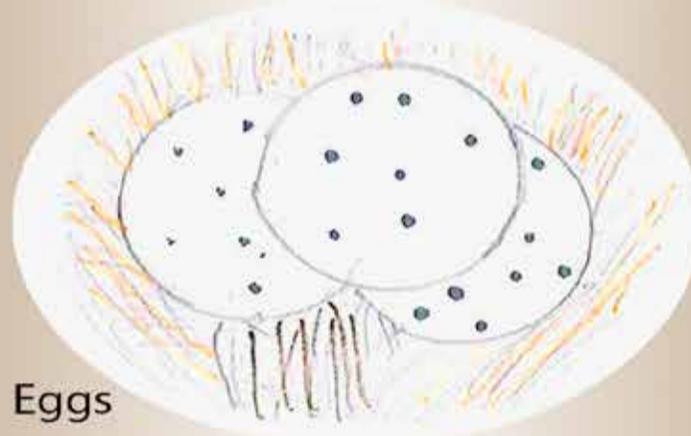
The total population was 50,000 in New Zealand and has dropped so much that they are only found in Hurunui.

Part of their habitat loss is from human activities ruining their breeding areas.

Banded dotterels lose their eggs to hawks, dogs, motorbikes and cars.

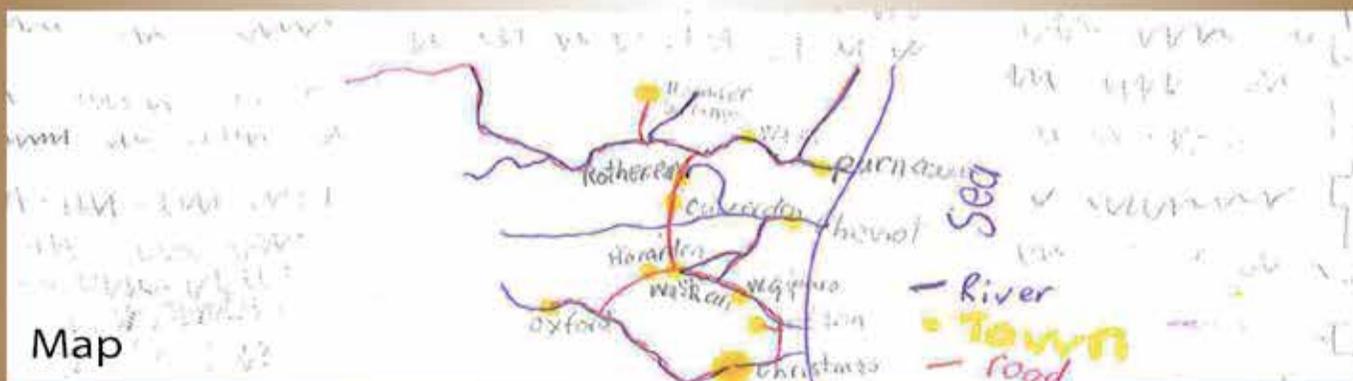
Banded Dotterel Breeding

Banded Dotterel pairs are territorial but there are a responsible amount of them. So their breeding is going okay, but could be better.



Eggs

They arrive at the breeding grounds and set up their territory in July. Their first eggs are laid in August to early November. Banded Dotterels have about three eggs.



Map



Once upon a time there was a mudfish.



That was named Patchy, and lived in a bog.



But everybody thinks he's crazy.



Fun Fact
Did you know that the length of a mudfish is 15cm.

One day (which was night to him), Patchy had a long think about how the other fish have been treating him.



Finally it was night (which was day to him) now patchy could start his adventure.



Patchy started his treasure hunt at the end of the bog, but he just couldn't find anything.



Fun Fact
Mudfish suffer droughts and can die from it.

Morning was coming and Patchy was getting sleepy and decided until he fell fast asleep.



Suddenly something quick came and swam Patchy up.



A falcon had swopped Patchy up.



Fun Fact
Mud fish love eating worms and snails.

This looked like the end for Patchy but his eye popped out and saved the day.



Lucky Patchy landed in a new Swamp with treasure and a new canoe that was cooler than ever.



And he lived happily ever after.



Fun Fact
Mudfish have a cigar-shaped body.

Complete this wordsearch.

falcon	Crazy	patchy							
mudfish	treasure	bag							
m	a	b	e	d	e	f	g	h	i
j	u	k	l	m	n	o	p	q	r
r	s	d	t	u	r	v	w	f	x
c	y	z	f	a	e	b	c	a	d
r	e	f	g	i	a	h	i	j	k
a	k	l	p	m	s	n	o	c	p
z	q	r	a	s	u	n	t	o	u
y	v	w	t	x	r	y	z	n	a
b	c	d	c	e	e	f	g	h	i
j	k	l	h	m	n	o	p	q	r
s	t	u	y	v	b	o	g	x	y

Fun Fact
Mudfish can survive dry seasons for several months.