



Tāiko/Black Petrel and other seabirds

EDUCATION RESOURCE YEARS 5- 8 (SENIOR PRIMARY)



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INTRODUCTION



About this resource

This resource is an integrated unit of teaching and learning material about the black petrel/ tāiko and other seabirds, for use in primary schools.

Students are first introduced to seabirds and the black petrel/ tāiko and then extend their learning inquiry to investigate and research gannets/tākapu, little blue penguins/kororā and red-billed gulls/tarāpunga. They go on to look at various aspects of a focus seabird and examine the issues affecting it. The unit concludes with planning and implementing informed, meaningful action for seabirds.

The resource has been developed for year 5 - 8 primary teachers, with a New Zealand context. It incorporates aspects of Te Ao Māori and addresses science, social science, English, mathematics and environmental education/ education for sustainability objectives from across the NZ Curriculum.

What is a black petrel/ tāiko?

Black petrels/ tāiko are burrow-nesting seabirds that breed only in New Zealand. They have been identified as one of our most threatened seabird species. They are known to Māori as tāiko. Sometimes they are also called Parkinson's petrels. They were once widespread over much of New Zealand, as far inland as Tongariro in the North Island and found in the forests of Northwest Nelson. But now, because of pests, habitat destruction and other threats, only breed on two offshore islands in Northern New Zealand: Great Barrier Island/Aotea and Little Barrier Island/ Hauturu. Black petrels fly thousands of kilometres over the South Pacific Ocean every year to spend their winters in South America.

For more information about black petrels see: nzbirdsonline.org.nz/species/black-petrel

What is environmental education/ education for sustainability?

Education for sustainability is about learning to think and act in ways that will safeguard the future wellbeing of people and our planet. . Environmental education involves the integration of three key dimensions: education about the environment, education in the environment and education for the environment. The resource follows the aims, dimensions and objectives in the 'Guidelines for Environmental Education' by the Ministry of Education.

Objectives of the resource

Vision

This resource will build foundations for:

- Young people who are informed about seabirds and the issues they face
- Students and communities who are able to think creatively and connect with others to be actively involved in caring for seabirds

Key concepts

- The ecology of the black petrel and other seabirds
- Life cycle, habitat and breeding information
- Red-billed gulls, little blue penguins, gannets
- How people affect seabirds
- Threats to seabirds
- Protection of seabirds
- Future -focussed thinking
- How to help seabirds in their community

How to use the resource

The resource has been based on an inquiry model and uses constructivist/ student-centred pedagogy.

It is intended that teachers and students take the material in the resource and use it to best suit individual and collective needs. The programme can be adapted to suit a school's own inquiry model or way of teaching and learning. Timing will depend on your needs as a school. Consider options and timing for visiting seabird colonies when planning your unit.

Curriculum links

The following values, key competencies and principles are incorporated into the resource:

Values

Ecological sustainability; Respect; Inquiry and curiosity; Innovation; Diversity; Community and participation

Key competencies

Thinking; Using language, symbols and text; Managing self; Relating to others; Participating and contributing

Principles

Learning to learn, Cultural diversity, Community engagement, Future focus

Learning areas

Achievement objectives from relevant subject areas are listed in the teacher notes of each activity. Specific learning intentions and success criteria deriving from the AO's are listed in each learning experience.

The following subject areas and strands are included in the resource:

Science

Nature of Science: Understanding about science, Investigating in science, Communicating in science, Participating and contributing

Living world: Life processes, Ecology

Social Sciences

Social studies

English

Processes and strategies: Listening, Reading and Viewing and Speaking, Writing and Presenting

Ideas

Technology

Technological Practice: Brief development

Minor links also to:

Mathematics, Health, The Arts, Education for sustainability/ Environmental education

Structure of resource - possible learning sequence

Section One The tāiko/ black petrel and other seabirds	Section Two People and seabirds	Section Three Helping seabirds
BIG IDEA: Seabirds like the tāiko, are unique NZ birds with special features, behaviours and adaptations	BIG IDEA: People influence seabirds and their habitats	BIG IDEA: We can all contribute to a positive future for seabirds
Introducing the tāiko and other seabirds Adaptations and special features Life cycle and habitats	How humans impact on seabirds and their habitats Threats to seabirds Visiting seabirds in the local environment	Examining the current situation Sharing our knowledge Helping seabirds Reflecting on actions
Inquiry stages 1 -4	Inquiry stages 5 -7	Inquiry stages 5- 9
This section relates to: EE: ABOUT the environment Major learning area: Science	This section relates to: EE: ABOUT and IN the environment Major learning area: Social Science	This section relates to: EE: FOR the environment Major learning areas: Science, Technology and Social Science

Example unit plan

Overarching topic: Black petrels/ tāiko and other seabirds

Overlying key concepts:

- Seabirds like the tāiko, are unique New Zealand birds with special features, behaviours and adaptations
- People influence seabirds and their habitats
- We can all contribute to a positive future for seabirds

Values

Ecological sustainability, respect, inquiry and curiosity, innovation, diversity, community and participation

Key competencies

Thinking; Using language, symbols and text; Managing self; Relating to others; Participating and contributing

Principles

- Learning to learn
- Cultural diversity
- Community engagement
- Future focus

Learning areas

- Science: Living world, Nature of Science
- Social Sciences
- English
- Technology: Technological Practice
- The Arts
- Mathematics
- IT
- Education for sustainability

Section One Getting to know the black petrel/ tāiko and other seabirds Learning experiences 1-4				Section Two People and seabirds Learning experiences 5-7			Section Three Helping seabirds Learning Experiences 8-9		Implementing ac- tion	
1. Meet the tāiko/ black petrel	2. Special features and adaptation Starting an inquiry	3. Habitat and life cycle	4. Finding out about seabirds	5. People and seabirds	6. Threats to seabirds Extending your inquiry	7. Experiencing seabirds in their environment	8. Protection of seabirds Sharing your findings	9. It's time to help seabirds Implementing action	(This week and beyond) Reflection and review	
Inquiry stages										
1	2	3	4	5	3, 4, 5	5, 6	7	8	9	
Suggested timing Weeks 1-4				Weeks 5-7			Weeks 8-9			

Inquiry-based learning

Inquiry based learning is a constructivist approach, where the student is at the centre of learning. Students have ownership of the learning and are involved in developing the unit of study.

This teaching model incorporates a variety of thinking skills, information literacy skills and integrates well with information technology. Students form and develop an inquiry to investigate aspects of the topic and build a depth of understanding through questioning, thinking and research.

Working through your inquiry

The learning experiences within the resource are a guide only. It is intended that teachers adjust the activities and learning sequence to suit the needs and interests of students.

Use this inquiry model or your school's model to guide the teaching and learning during your unit.

Stages in the inquiry model

Stage 1: Dive in

This is the first stage of the inquiry- a time to set the scene and introduce the topic. At this stage, information is gathered about the prior knowledge of students in order to develop a unit plan which will meet their learning needs, prior experience and interests. The topic is introduced and some content is taught to form a foundation of knowledge, in order to begin a learning inquiry about seabirds.

Key questions:

What do we know already?

What is interesting about this topic for us?

What do we want to know?

Stage 2: Ask

Students now have been introduced to the black petrel and other seabirds. They begin to ask questions and explore their ideas. It is suggested that teachers group questions into subject areas and then identify one main 'rich/ essential' question and several minor questions branching off from this. A rich question has multiple answers and is an open question, requiring extensive research to answer. This forms the basis for the inquiry.

Key questions:

What will we investigate?

What is our rich/ essential question?

What else will we need to know?

Stage 3: Investigate

At this stage of the inquiry, students are investigating their questions and further explore the topic. Their research should be driven by their interests and inquiry questions. Students can follow lines of further inquiry to explore the topic in-depth.

Key questions:

How can we find out about our topic?

Which information is relevant to our inquiry?

How can we organise the information?

Stage 4: Thinking

At this stage of the inquiry students are encouraged to use specific thinking skills to further explore a topic and seek understanding. Students now take the information they have gathered and begin to compare, order and sort it. At this stage, students also look into aspects of social inquiry: values and perspectives, finding out information and considering responses and decisions. They begin to look at aspects of future-focussed thinking, creative thinking and problem solving.

Key questions:

What does the information tell us?

Can we see any patterns/ trends?

Do we need more information?

Stage 5: Coming to conclusions

Next, students consider the information they have gathered and begin to look at the broader situation in order to draw conclusions. This may be extended to include a global perspective. Students make decisions about the current situation for a focus seabird and which issue is most engaging and relevant for them.

Key questions:

What did we find out?

What new ideas have come from this information?

How can we problem solve?

Stage 6: Sharing our findings

Students can now share the information, conclusions and observations with a selected audience. This can be a powerful link to community and lead to collaboration and further information sharing.

Key questions:

How can we communicate our knowledge and ideas?

Who do we want to share this information with?

What does our audience think?

Stage 7: Planning for action

Students now create a brief to ensure their action will target the focus issue and is achievable. Now that there is a focus for action they can begin to plan the logistics of how to carry it out.

Key questions:

What can we do to help this situation- what action will we take?

What issue will this address?

What will we need? / Who will help us?

Stage 8: Implementing action

It's time to put the brief and plan into action to help seabirds. The action should target the focus issue and aim to create a positive future for seabirds.

Key questions:

Are we following our brief and criteria?

Is our action making a difference?

Stage 9: Review and reflect

Now that students have carried out their action they can now reflect on how it went. This may lead to further inquiry.

Key questions:

Did we do what we set out to do?

How did it go?

What are the next steps?

ACTIVITY 1:

Meet the black petrel / Tāiko



TEACHER NOTES

This learning experience introduces seabirds and the black petrel/ tāiko and explores students' prior knowledge and experiences.

Curriculum links

Achievement objectives

Science: Levels 3 and 4

Nature of Science: Investigating in Science

Build on prior experiences, working together to share and examine their own and others' knowledge.

Living World: Evolution

Begin to group plants, animals and other living things into science-based classifications.

Science capabilities

Gather and interpret data, Interpret representations, Engage with science.

Learning intentions

Students are learning to:

Share their knowledge and prior experiences of black petrels/ tāiko and other seabirds.

Success criteria

Students can:

Record their prior knowledge and experiences about black petrels/ tāiko and other seabirds.

Minor curriculum links

English: Speaking, Writing

Background information

What is a black petrel/tāiko?

Black petrels are burrow-nesting seabirds which breed only on offshore islands in Northern New Zealand. They are known to Māori as tāiko. Sometimes they are also called Parkinson's petrels.

Other species of petrel also regularly visit our northern islands, but black petrels are the only ones which have dark brown-black feathers and a creamy-white bill. The black petrel is one of our most threatened seabird species.

Why are black petrels/ tāiko a special taonga species?

Black petrels were once more widespread over the North and South Island of New Zealand. Before Europeans arrived they were an abundant and valued food source for Māori.

Since the 1950's, because of habitat destruction and introduced predators, these birds are now much more rare. They currently only breed on Great Barrier Island/Aotea and Little Barrier Island/ Hauturu in the Hauraki Gulf of Auckland. They are classified as 'vulnerable' in DOC's threat classification system. There are only approximately 5000 black petrels left in the world.

What is a seabird?

Seabirds spend most of their lives at sea and come ashore only to breed. Black petrels/ tāiko are true seabirds- they spend most months of the year at sea.

Why are seabirds important?

They provide an important link between land and sea. Seabirds and their young bring valuable nutrients from the ocean to the forest, through their waste and remains. They also play a part in maintaining balance within ocean ecosystems through their part as predators in food webs.

Seabirds of the Hauraki Gulf

Around 25 species of seabirds breed in the Hauraki Gulf- a significant number compared to other areas worldwide. Birds such as gannets, shearwaters, petrels and albatrosses may spend part of the year travelling across the Pacific, and then come back to the Hauraki Gulf to breed.

Why assess prior knowledge and experience?

To plan an engaging, inquiry-based unit relevant to your students, it is important to recognise their prior knowledge and experiences. [Seabird Bingo](#) can give an indication of prior experiences and the backgrounds of your students.

[Recording Knowledge](#) can provide information about knowledge gaps and misconceptions.

Reflecting on these activities and other assessment information will allow you to plan future learning experiences that are appropriate for your students' needs and interests.



Taiko at sea. Photo credit: Isabel Mabey.

ACTIVITY 1:

Meet the black petrel / tāiko



LEARNING EXPERIENCE

Focus question: What do we already know about black petrels/ tāiko and other seabirds?

Resources for this activity

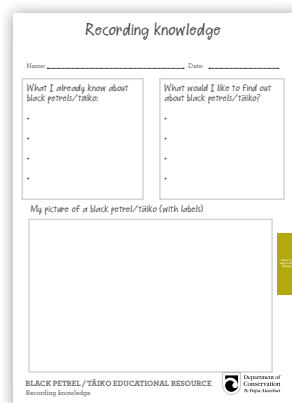
Click to view and print these resources.



Treasures of the Hauraki Gulf



Seabird bingo



Recording knowledge



Black petrel PowerPoint

Vocabulary

Tāiko, black petrel, seabird, prior, experience, knowledge, burrow, fledge, taonga

Introducing the black petrel/ tāiko

Introduce the black petrel/ tāiko through the [Black petrel PowerPoint/](#) [Treasures of the Hauraki Gulf Poster/](#) specimen.

Examining prior experiences

Discuss prior experiences of seabirds. This could be through group discussion or paired conversations.

Use [Seabird Bingo](#) to encourage further discussion. Students can have brief conversations with others to find people who have had the experiences listed. They can then record names of those who have had the experiences and tick the appropriate squares until they have completed the grid. To maximise dialogue, suggest that they obtain as many different names as possible on their grid.

Were students able to find someone for each square? What are the reasons for this? (This may be because of your location, community interests etc...)

Recording prior knowledge

Use [Recording Knowledge](#) to record prior knowledge and any questions. (If students are having difficulty thinking of what they already know- ask which pictures and words come to mind? Where did their knowledge come from? - a person/ place/ experience?)

NB: The drawings are about recording knowledge - not demonstrating artistic skills.

Show [Black petrel PowerPoint](#) and discuss the following questions:

- What is a seabird?
- Why are black petrels/ tāiko important? (see teacher notes on previous page)

Reflecting on our learning

For students: Re-examine the focus question: Do we have a lot or a little prior knowledge of seabirds such as black petrels? Has anyone in our classroom seen a black petrel/ tāiko before? What would we like to find out next?

For teachers: Use [Recording Knowledge](#) and information from your discussion to inform the planning of your unit with students. The drawings are a record of prior knowledge (a 'before' view) which can be referred to later to assess learning. After reflecting on these activities, establish which content you will teach and therefore which learning experiences from this resource will be relevant- (these may be different for individuals or groups of students).

Extension/ further learning

Discuss prior knowledge and experiences of other seabirds.

How does this differ to students' knowledge and experiences with black petrels?

ACTIVITY 2:

Special features and adaptations



TEACHER NOTES

This learning experience examines the physical adaptations of black petrels/ tāiko which allow them to survive in their environment.

Curriculum links

Achievement Objectives

Science: Levels 3 and 4

Living World: Ecology

Explain how living things are suited to their particular habitat and how they respond to environmental changes, both natural and human-induced.

Nature of Science: Investigating in Science

Ask questions, find evidence, explore simple models and carry out appropriate investigations to develop simple explanations.

Science capabilities

Gather and interpret data, Use evidence.

Learning intentions

Students are learning to:

- Identify the adaptations of black petrels/ tāiko
- Examine how tāiko are suited to the environments they live in at different stages of life.

Success criteria

Students can:

- Identify several adaptations of black petrels/ tāiko
- Describe how tāiko are suited to their environment at different stages of their lives.

Minor curriculum link

English: Speaking, Writing

English: Listening, Reading and Viewing

Background information

What are adaptations?

Adaptations are features that animals or plants have evolved, to enable them to live in a particular habitat. Animals have evolved over time to live in different areas - on land and at sea. Our native birds have evolved special adaptations to cope with their New Zealand conditions and to access different food sources.

Black petrels/ tāiko have both physical and behavioural adaptations. This activity examines only their physical adaptations.

Why do black petrels/ tāiko need adaptations?

Adaptations help animals to cope with the conditions of their environment. Young petrels are adapted for life in burrows on the forest floor. Adults are adapted to live primarily at sea. When adults come ashore to breed, they crash through the forest, as they are more adapted to live at sea.

What physical adaptations do adult black petrels/ tāiko have?

- Short legs and webbed feet – act like oars and paddles to move quickly on the water
- Tube nose – petrels only drink salt water, so must sneeze out concentrated salty fluid from their tube nose (other seabirds have salt glands above the eye sockets to remove salt)
- Powerful hooked beaks- for catching prey
- Long wings compared to their body- to help them to fly long distances
- Light yet strong bones – Light bones for easy flying but also very strong for diving deep under water
- Feather coating – The birds preen their feathers with a waxy oil to protect them and help repel water
- Multi-layered feathers – to insulate birds from the cold and help repel water
- Dark colouration – to provide camouflage for feeding at night
- Good sense of smell and sight – to catch prey and sense danger

What adaptations do young black petrels/ tāiko have?

Young black petrels (juveniles) have downy feathers and thick layers of fat to keep them warm. Their digestive systems can cope with large amounts of food at a time- their stomachs are so expandable that petrel chicks can sometimes double their body weight after a single feed. Adult features develop slowly in the juveniles.

How are seabirds different to land birds?

Seabirds are adapted to life at sea. Adult seabirds are able to fly long distances (hundreds of kilometres at a time). Their beaks are designed for catching fish and their bodies are streamlined for diving. Most are able to drink salt water and can deal with salt in their food. These differences enable seabirds to spend long periods of time at sea and to migrate over huge distances across the ocean.



Taiko chick in its burrow. Photo credit: Dave Boyle

ACTIVITY 2:

Special features and adaptations



LEARNING EXPERIENCE

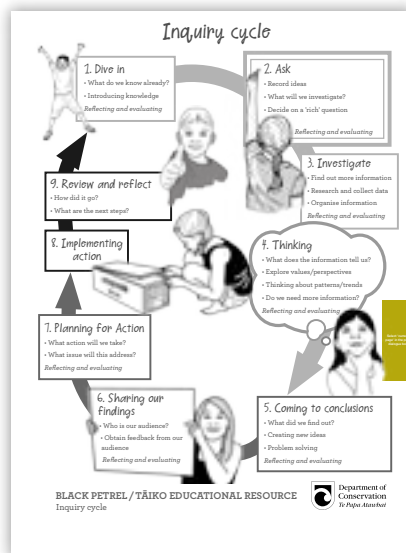
Focus question: What are the special features and adaptations of black petrels/ tāiko and how are they suited to their environment?

Resources for this activity

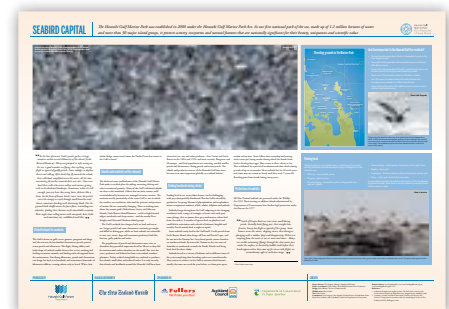
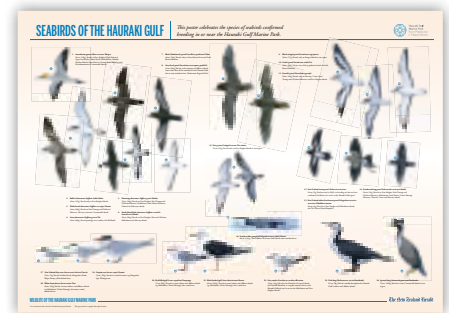
Click to view and print these resources.



Treasures of the Hauraki Gulf



Inquiry cycle



Seabirds of the Hauraki Gulf



Black petrel PowerPoint

Adaptations of tāiko

Match the adaptation pictures to the text which describes them.

<p>Short legs and webbed feet Tāiko legs are like oars and their feet act like paddles to move them quickly and easily through the water.</p>	<p>Light but strong bones Bones are light (for easier flying) but also very strong (for diving deep under water).</p>	<p>Navigation "Internal compass" to be able to sense direction and navigate (find their way).</p>
<p>Tube nose Petrels have a special tube nose which separates the salt out of salt water so they can drink it.</p>	<p>Feather coating The birds press their feathers with a waxy oil to protect their feather layers and help repel water.</p>	<p>Large wings compared to their bodies To help them fly long distances.</p>
<p>Powerful hooked beak For catching prey.</p>	<p>Good sense of smell and sight To catch prey, find their burrows and sense danger.</p>	<p>Multi-layered feathers To keep warm and help repel water.</p>
<p>Dark coloured body To provide camouflage.</p>		

BLACK PETREL / TĀIKO EDUCATIONAL RESOURCE Department of Conservation Te Papa Mātauranga

Adaptations of tāiko

Vocabulary

Adaptation, environment, special features, waterproof, camouflage, navigation, inquiry

Special features of the black petrel/ tāiko

Observe features of the black petrel/ tāiko through [Black petrel PowerPoint](#)/ poster/ specimen.

Why would the black petrel have some of these features? Encourage discussion.

Introduce the vocabulary- adaptation (see teacher notes). Explain that adaptations help animals to survive in their environment and have evolved (been developed) over thousands of years.

Examining adaptations

Revisit [Black petrel PowerPoint](#) and posters. Ask students to more closely observe adaptations of the black petrel/ tāiko. Consider how their adaptations relate to how they feed, what they eat and drink, where they spend most of their time, how they keep waterproof/ warm and where they travel to.

Compare adaptations of young tāiko to adult birds through the pictures in the slideshow or the [Treasures of the Gulf: Black Petrels poster](#).

Discuss why adaptations are different for each stage of life. Record ideas.

Examine taxidermy specimen and bones (if available). Allow students to measure (or research) the length of tāiko wings and bodies. Discuss why the wings are long compared to the body (to help with stability for long flights). Students could construct a life-size model to understand the size of the bird and its proportions.

Share [Adaptations of tāiko](#) to further investigate the black petrel's adaptations.

Watch the NIWA video [Seabird diversity in the Southern Ocean](#) to learn about adaptations of some other seabirds. (Suitable for Year 6 +)

See [PBS](#) for a game to learn more about general seabird adaptations.

Reflecting on our learning

Re-examine the focus question: What have we discovered about how black petrels are suited to their environment?

Students could re-draw a black petrel/ tāiko and label their adaptations. How does this drawing compare with their earlier drawing from Activity 1?

For students: Why do black petrel/ tāiko need adaptations?

For teachers: What further learning (if any) do individuals need around adaptations?

What would we like to find out next about black petrels? Record questions on Post-it notes, then group questions into categories.

Share the [Inquiry Cycle](#) and together establish a shared inquiry question or group questions to guide your unit.

Extension/ further learning

Use [Seabirds of the Hauraki Gulf poster](#) to compare the adaptations of other seabirds. How are black petrels/tāiko the same as other seabirds and how do they differ? Use a venn diagram to record ideas/ make comparisons.

Collect feathers from a local beach or bird habitat. Use magnifying glasses/ microscopes to look at different feathers. Observe the structure of the feathers. Make inferences about how different feathers do different jobs e.g. repel water.

In groups, make a life-size model of a tāiko, including its adaptations.

ACTIVITY 3:

Life cycle and habitat



TEACHER NOTES

This learning experience explores the habitats and life cycle of black petrels/tāiko.

Curriculum links

Achievement Objectives

Science: Levels 3 and 4

Living World: Life processes

Recognise that there are life processes common to all living things and that these occur in a variety of ways

Nature of Science: Investigating in science

Ask questions, find evidence, explore simple models and carry out appropriate investigations to develop simple explanations

Science capabilities

Use evidence, interpret representations

Learning intentions

Students are learning to:

- Make observations about the lifecycle and habitats of the black petrel.
- Investigate the stages in the life cycle of the black petrel/tāiko and explore how these relate to their habitats

Success criteria

Students can:

- Record information about the life cycle and habitats of black petrels/tāiko.
- Identify the stages in the life cycle of the black petrel and how they relate to their habitats.

Minor links

English:

Listening, Reading and Viewing

Background information

What is a life cycle?

A life cycle is the series of stages a living thing passes through during its lifetime- from birth to death.

What is a habitat?

A habitat is a place where an animal (or population of animals) normally lives.

Black petrel life cycle summary

Black petrels / tāiko are migratory seabirds. During the breeding season they live on Great Barrier Island/Aotea (about 1300 breeding pairs) and Little Barrier Island/Hauturu (about 100 breeding pairs). While chick rearing they cover great distances to find food. After bringing up their chick, in around June to July, black petrels migrate across the Pacific Ocean to the warmer coasts of South America, mainly around Ecuador and Peru.

Where do black petrels/ tāiko live?

The black petrel's habitat changes at different times of their life cycle.

Possible habitats:

Eggs/ chicks: In burrows on Little Barrier Island/ Hauturu or Great Barrier Island/ Aotea

Fledgling: In the Hauraki Gulf and surrounding areas or Pacific Ocean

Juvenile: In South America (off the coast of Peru and Ecuador)

Breeding adult: In the forest on Little Barrier Island/ Hauturu or Great Barrier Island/ Aotea, or in the Hauraki Gulf and surrounding areas.

Migrating adult: Pacific Ocean

Non-breeding adult: South America (off the coast of Peru and Ecuador)

Tāiko chicks fledge after 96-122 days. After fledging, they make the long journey to South America.

NB: Young birds return to New Zealand when they are 3-6 years old and begin breeding at 5-7 years.

What is a black petrel chick's life like?

After long trips at sea, adults feed their chicks meals of stomach oil (a special diet made from highly concentrated food residues). Chicks are left alone in burrows from a few days old and only see their parents at night. Once they are fully grown, the chicks go to sea and have no further contact with their parents. They learn to find food on instinct alone.

Why do some seabirds now only breed on offshore islands?

Offshore islands often provide the best habitat for birds. Many areas on the mainland have been cleared

over time for various reasons (e.g. farming and development). Offshore islands usually have undisturbed areas and fewer introduced predators, providing more chance of eggs and chicks surviving.



Taiko launch rock on Aotea/Great Barrier Island.

Photo credit: Dave Boyle

ACTIVITY 3:

Life cycle and habitat

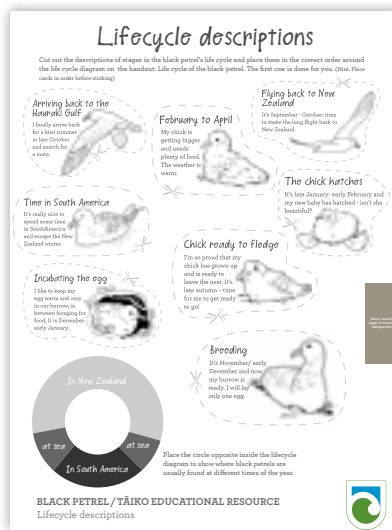


LEARNING EXPERIENCE

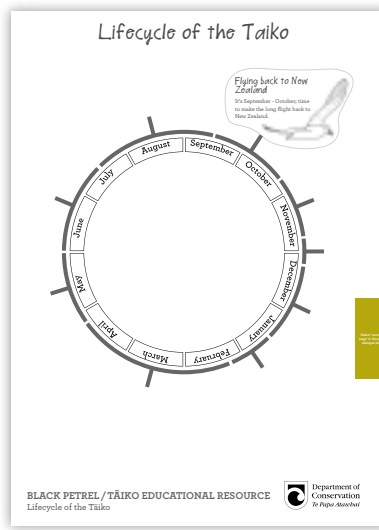
Focus questions: What is the life cycle of the black petrel/ tāiko? Where do they live during different stages of their life cycle?

Resources for this activity

Click to view and print these resources.



Lifecycle descriptions



Lifecycle of the tāiko



TVNZ Meet the locals: gannets galore



TVNZ Meet the locals: black petrel



Seabirds return

Vocabulary

Habitat, life cycle, migration, foraging, juvenile, chick, adult, breeding, incubating, rearing, location, season, fledge, burrow, hatched, flight, gannets

Introducing seabird habitats

Introduce the vocabulary - habitat (see teacher notes).

What would suitable seabird habitat look like? Students can discuss with a partner. Display the poster:

[Wonders of the Gulf: The Seabirds return](#). The poster shows an example of breeding habitat on Little Barrier Island/ Hauturu for some New Zealand seabirds such as the black petrel/ tāiko. On the poster, students can see a black petrel burrow, chick and adult. Cook's petrel and other seabirds are also featured on the poster.

Explain that most adult seabirds only go on land to breed and that they will be at sea at other times.

Examining the life cycle of tāiko

Introduce the vocabulary - life cycle (see teacher notes). What questions do students have about seabird habitat and life cycles? Record these to develop your inquiry.

View the [Meet the locals- black petrel video](#). During the viewing, students could watch and listen for information about the life cycle of black petrels/ tāiko.

Discuss students' observations from the video clip. Record facts and information about the life cycle and habitat of black petrels in groups or together as a quick brainstorm.

Re-examine the different stages of the life cycle (egg- chick- fledgling-juvenile/ young petrel- adult...) on the poster above.

In pairs or individually, students could use their notes and other resources to complete [Life cycle of the black petrel/tāiko](#). Cut out the descriptions on [Life cycle descriptions](#) and stick them onto the life cycle. Point out that not all black petrels/ tāiko will follow the sequence described during every year of their lives (Juveniles will stay in South America for a few years before starting to breed).

Reflecting on our learning

For students: Where do black petrel/ tāiko live at the different stages of their life cycle? Why do they move around at different times in their lives? Encourage students to draw on the different sources of information (poster, video, activity) in order to infer ideas.

For teachers: What further learning (if any) do individuals need around habitat /life cycles?

Extension/ Further learning

Explore other species of seabirds' habitats and life cycles.

Many seabirds must share their coastal habitat with people. Gannets/ Tākapu are one species which live in close proximity to people. Watch the [Meet the locals: Gannets galore video](#). After viewing, discuss the differences between gannets' and black petrel/ tāikos' habitats and life cycles.

ACTIVITY 4:

Finding out about seabirds



TEACHER NOTES

This learning experience examines the differences and similarities between black petrels and other seabirds. Students begin to extend their learning through using research skills and different thinking processes in order to develop their inquiry.

Curriculum links

Achievement objectives

Science: Levels 3 and 4

Nature of Science: Investigating in Science

Ask questions, find evidence, explore simple models and carry out appropriate investigations to develop simple explanations.

Living World: Life processes

Recognise that there are life processes common to all living things and that these occur in different ways.

English: Levels 3 and 4

Listening, Reading and Viewing

Processes and strategies:

Integrate sources of information, processes, and strategies confidently to express ideas.

Ideas:

Show an increasing understanding of ideas within, across and beyond texts.

Learning intentions

Students are learning to:

- Compare how different seabirds breed, eat and live and identify similarities and differences between them.
- Integrate sources of information to make inferences and think beyond texts.

Success criteria

Students can:

- List similarities and differences between different seabirds.
- Use different sources of information to make inferences and record resulting questions.

Minor links

Listening, Reading and Viewing

Science capabilities: Use evidence, interpret representations

Background information

Why do different seabirds have different habitats, features and diets?

Seabirds have evolved to occupy different roles in the ecosystem. The roles that different birds play in the ecosystem have some overlap but each species has a special role to play (a niche), reducing competition and improving the chances of all animals surviving.

Do all seabirds have the same chances of survival?

Because of certain tendencies, preferences, habitats and diets some seabirds may be more susceptible to changes in population and changes to their environment. Black petrels have been identified as being one of the most at-risk seabirds because their feeding habits and range coincide with the fishing season and the areas where commercial fishers work.

Little blue penguin/ kororā

This is the smallest penguin species with great diving ability. They are flightless. Penguins must do an annual moult of all feathers in one short burst. Therefore they must come to land in very good condition, as they can't stay out at sea during the moult. They usually lay 2 eggs. Their numbers are currently decreasing.

Gannet/ tākapu

Gannets are large seabirds which dive from flight down to 15 metres underwater to get fish. They nest on rock or coastal surfaces in dense colonies. They lay a single egg and some migrate to Australia. When they are not nesting they can be found in harbours, estuaries and at sea. Their numbers are currently increasing.

Red-billed gull/ tarāpunga

Red billed gulls are a relatively common and well-known seabird, however their numbers are seriously declining at many colonies. They live near the coast, in many places in New Zealand.

Red-billed gulls eat natural food by catching fish and insects or scavenge food from people near the coast or behind fishing boats. While breeding, some populations mainly eat krill- a vulnerable species that are not always available- because of climate change, krill fishing and changes in predator numbers.

Black petrel/ tāiko

A burrow-nesting seabird which now only breeds on Great Barrier/ Aotea and Little Barrier/ Hauturu islands in the Hauraki Gulf, in Auckland. These seabirds are great fliers- they fly to South America for our winter. They feed on squid and fish, well out at sea. Black petrel numbers are decreasing. See previous activities for more information.

Why are black petrels vulnerable?

Black petrels fish during the same season and in the same areas as humans do. They are sometimes caught by commercial and recreational fishers. Black petrels have been identified as the most at-risk seabird from commercial fishing.

Habitat destruction and pests have also had an impact on their numbers. As people move to coastal areas they often change forest habitat and bring introduced predators and pests such as rats and mustelids who prey on eggs and young birds. The long migration of black petrels also has an impact on the population, especially for fledglings, as around 50% do not make it on their first trip to South America. The reasons for this are varied.

Research and information literacy

This learning experience is designed to encourage the skills of sorting, finding and recording relevant information. Students need to begin to ask their own questions and extend their own learning. They are encouraged to look for information from a variety of sources: books, web-based material and journals.

ACTIVITY 4: Finding out about seabirds



LEARNING EXPERIENCE

Focus question: How are black petrels the same/ different from other seabirds?

Resources for this activity

Click to view and print these resources.

Little blue penguin / kororā facts

Interesting Facts

- Little blue penguins are the smallest penguins in the world.
- Penguins are flightless birds but they are excellent swimmers and divers.
- All penguins march (they have all their feathers) once a year.

Threats:

Feeding:

Lifecycle:

Habitat:

Notes and key points:

Little blue penguins are not threatened.

BLACK PETREL / TĀIKO EDUCATIONAL RESOURCE
Little blue penguin/facts facts

Department of Conservation
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Red-billed gull facts

Little blue penguin / kororā facts

Interesting Facts

- Little blue penguins are the smallest penguins in the world.
- Penguins are flightless birds but they are excellent swimmers and divers.
- All penguins march (they have all their feathers) once a year.

Threats:

Feeding:

Lifecycle:

Habitat:

Notes and key points:

Little blue penguins are not threatened.

BLACK PETREL / TĀIKO EDUCATIONAL RESOURCE
Little blue penguin/facts facts

Department of Conservation
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Little blue penguin facts

Gannet / tākapu facts

Interesting Facts

- Gannets are one of the few birds with perfect balancing act when they land.
- Gannets can reach up to 100 km per hour when diving for prey.
- They have special air sacs inside their bodies to cushion their impact when they dive into the water.

Threats:

Feeding:

Lifecycle:

Habitat:

Notes and key points:

Gannets are not threatened.

BLACK PETREL / TĀIKO EDUCATIONAL RESOURCE
Gannet facts

Department of Conservation
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Gannet facts

Black petrel / tāiko facts

Interesting Facts

- Black petrel has been recognized as the most critically endangered seabird.
- Seabirds black petrels that diverge slightly in habitat.
- They are usually quiet at sea and only make noises when they come back to their haunts at night.

Threats:

Feeding:

Lifecycle:

Habitat:

Notes and key points:

Black petrels are threatened.

BLACK PETREL / TĀIKO EDUCATIONAL RESOURCE
Black petrel/facts

Department of Conservation
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Black petrel facts

SEABIRDS OF THE HAURAKI GULF

The great auklets are the most common seabirds in the Hauraki Gulf Marine Park.

Other seabirds include: Great Frigatebird, Red-tailed Tropicbird, Black Noddy, Brown Noddy, Masked Booby, Red-footed Booby, Black Petrel, and Tāiko.

Department of Conservation
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Seabirds of the Hauraki Gulf

Inquiry cycle

- 1. Dive in**
- What do we know already?
- Identifying knowledge
- Reflecting and evaluating
- 2. Ask**
- Record ideas
- What will we investigate?
- Decide on a test question
- Defining and evaluating
- 3. Investigate**
- Find out more information
- Research and collect data
- Organize information
- Reflecting and evaluating
- 4. Thinking**
- When does the information tell us?
- Explore values/permissions
- Thinking about patterns/trends
- The use and reuse information
- Reflecting and evaluating
- 5. Coming to conclusions**
- What did we find out?
- Creating new ideas
- Problem solving
- Reflecting and evaluating
- 6. Skimming our Findings**
- Who is our audience?
- Check feedback from our audience
- Reflecting and evaluating

BLACK PETREL / TĀIKO EDUCATIONAL RESOURCE
Inquiry cycle

Department of Conservation
© Te Papa Mōhiohio

Inquiry cycle

Seabirds: What is the same? What is different?

Seabird 1 Seabird 2

What is the same?

What is different? What is different?

Thinking: Are these seabirds similar or very different? Why?

Other questions

BLACK PETREL / TĀIKO EDUCATIONAL RESOURCE
Seabirds: what is the same/different?

Department of Conservation
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Seabirds: what is the same/different?



Black petrel PowerPoint

Vocabulary

Breeding, threats, colony, introduced predators, trawling, differences, compare, migrate

Fact sheets vocabulary challenges:

- Black petrel facts: bioluminescent, fledge, commercial fishing, crustaceans, Hirakimata, Hauturu, Aotea, destruction, techniques, Ecuador, recognised, migrate
- Gannet facts: incubate, coast, pilchards, mackerel, mainland, migrate, Cape Kidnappers, Hawkes Bay, colonies, disturbance, fishers
- Little blue penguin facts: moult, coast, flightless, introduced predators, Chatham
- Red-billed gull facts: Krill, decreasing, coast, colonies, introduced predators

Introducing the seabirds

Revise the features of seabirds. Introduce the four seabirds that are the focus for this activity: gannet, little blue penguin, red-billed gull and black petrel through the poster: [Seabirds of the Hauraki Gulf poster](#) or the [Black petrel PowerPoint](#).

Students as scientists

Encourage students to take on the role of a scientist. Each group of 'scientists' can investigate one species of seabird. Groups of students can become experts on their species. Resources are provided on the four seabirds: black petrels, little blue penguins, red-billed gulls and gannets. Other species could be researched using alternate reading materials according to student inquiries.

Ask groups to decide what they would like to investigate about their species (this could be an extension of the inquiry question from Activity 2).

Record ideas about how the students might find answers to their questions e.g. websites (see IT links), books and journals (see literacy links).



Gannet-takapu. Photo credit: Kyle Bland

Seabird research

Use [black petrels](#), [gannets](#), [little blue penguins](#) and [red-billed gulls](#) facts to aid students' research. Introduce the vocabulary from the titles of the fact sheets- e.g. breeding, feeding, threats, incubation period etc...

Revise the vocabulary challenges on right with each group to ensure understanding.

Ask groups to use their fact sheet and other sources of information to record notes and key points about their species of seabird. Record any questions they have along the way on their fact sheets.

If possible, allow groups access to books, journals and web pages to support their learning. This process could take one or several sessions.

Groups could share their findings with others, through a presentation or slideshow.

Each group could then link up with another group to explore similarities and differences between their two seabirds. Use 1.10.Seabirds: similarities and differences to guide discussion.

Reflecting on our learning

Re-examine the focus question: How are black petrels different from other seabirds? How are they the same?

Discuss answers to [Seabirds: similarities and differences](#). Reflect on how black petrels are the same/different to other seabirds.

Extension/ further learning

Further investigate students' questions and extend learning on a topic of their choice.

This research could lead in to a visit to a relevant site- e.g. a seabird colony (see Activity 7), museum or science centre.

Encourage students to extend their knowledge through contacting experts or planning their own investigations.



Red Billed Gull. *Photo credit: David Cook Wildlife Photography*



Blue penguin. *Photo credit: Rod Morris*

ACTIVITY 5:

People and seabirds



TEACHER NOTES

This learning experience examines how different groups of people interact with seabirds and influence them and their habitats.

Curriculum links

Achievement objectives

Social Sciences: Levels 3 and 4

Social Studies L3

Understand how people view and use places differently.

Social Studies L4

Understand how formal and informal groups make decisions that impact on communities.

Science capabilities

Gather and interpret data, use evidence

Learning intentions

Students are learning to:

- Investigate how different groups of people view and use a place (in relation to seabirds)
- Explore how the values and perspectives of groups influence their decisions

Success criteria

Students can:

- Explain how a group of people view and use a place (in relation to seabirds).
- Describe the values, roles and perspectives of a group of people and how these may influence their decisions.

Other curriculum links in this activity:

English: Speaking, Writing and Presenting

Science: Nature of Science: Participating and contributing

Background notes

How do groups of people influence seabirds?

Over time, people have dramatically changed large areas of coastal New Zealand and this has decreased available seabird habitat. Early settlers also introduced animals such as rats, stoats and cats which have become predators of our native birds. These introduced predators have reduced the numbers of seabirds, especially on the mainland. Nowadays, most New Zealanders are becoming more aware of how they influence seabirds and their natural environment. Many groups and organisations are doing more to help seabirds through working with others to do this important work.

Groups of people and seabirds provides fictional examples of groups who could be involved with any seabird. Use this as a starting point for researching groups of people involved with seabirds in your area.

What are values?

Values are deeply held beliefs about what is important or desirable. They are expressed through the ways in which people think and act (NZ Curriculum, 2007).

Our decisions and actions are influenced by our values and perspectives.

The key values identified in the NZ Curriculum are: excellence, innovation, curiosity and inquiry, diversity, equity, community and participation, ecological sustainability, integrity, and respect.

What are perspectives?

People can look at a situation from many different perspectives, such as: a historical perspective, scientific perspective, cultural diversity perspective or a human/ animal rights perspective. This activity aims to introduce a range of perspectives and demonstrate that a balance of perspectives is needed to effectively address a situation and find creative solutions to problems. There is no right or wrong answer and people need to work together to create new solutions.

A Māori perspective

Māori regard themselves as **tāngata** whenua - people of the land. They are tied to the land in many ways: through birth, whakapapa and ancestral links, spirituality and other relationships. Traditionally, Māori harvested certain seabirds such as tītī (muttonbirds/ sooty shearwaters) in a sustainable way. For more information see: www.teara.govt.nz/en/papatuanuku-the-land

What is mauri?

Mauri is the essence or life-force which is present in all living things. Where the connections between the environment and living things within it have been lost, the mauri is said to be depleted. We cannot see mauri but we can feel it. When this connection is lost, a place may feel uninviting and negative. In an area where the mauri is strong, that place would look and feel vibrant, energised and healthy and there would be plenty of biodiversity present.

Which groups of people are involved with black petrels/ tāiko?

If groups of people particularly involved with black petrels are relevant to your inquiry, you could examine the following groups:

- Local Iwi: Ngati Rehua Ngati Wai ki Aotea: www.ngatirehuangatiwaikiaotea.co.nz
- Wildlife Management International (WMIL) and Elizabeth Bell (Scientist): www.wmil.co.nz
- Department of Conservation: doc.govt.nz
- Fishing companies
- Recreational fishers
- Great Barrier Island schools e.g. Okiwi School: www.okiwischool.co.nz/website
- Stakeholders in Peru and Equador – e.g. local fishermen and Pro Delphinus (Peru): [youtube.com](https://www.youtube.com)

How are people working together to help seabirds?

Some examples of groups that are working together for seabirds are:

Southern Seabird Solutions. This is a trust dedicated to building a culture that mitigates the effects of fishing on seabirds in the Southern Hemisphere. They work with fishers, governments, agencies and individuals.

The Hauraki Gulf Forum. A forum which aims to improve the biodiversity and pest control in the Hauraki Gulf, administered by Auckland Council. It includes politicians, tāngata whenua, government organisations, not for profit groups and the public.

Black Petrel Action Group. A group of concerned people including representatives from DOC, Ngati Rehua Ngati Wai ki Aotea, WMIL and others. It was formed after the black petrel was identified in 2011 by the Ministry of Fisheries as the most at-risk seabird in Aotearoa.



WMIL workers monitoring on Great Barrier Island' credit Becs Gibson

ACTIVITY 5: People and seabirds

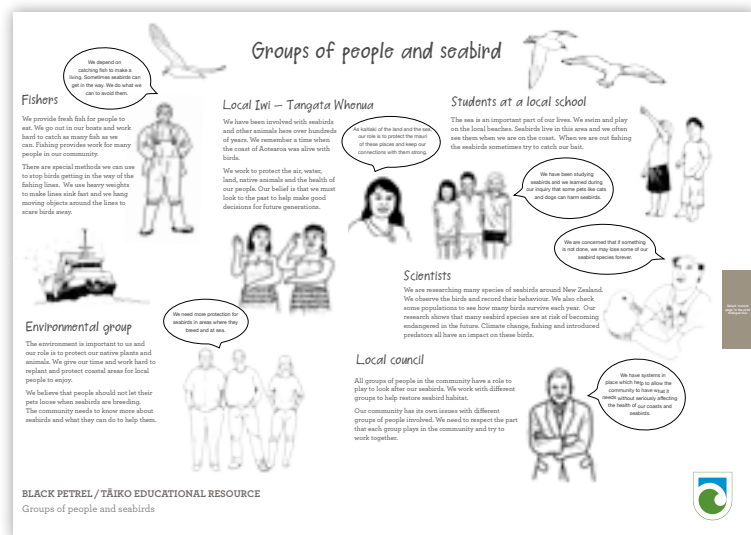
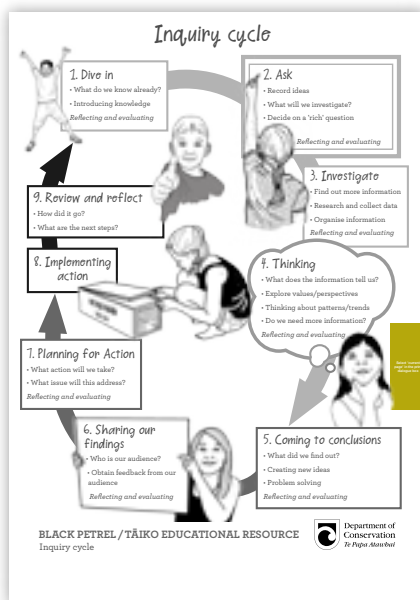


LEARNING EXPERIENCE

This learning experience examines how different groups of people interact with seabirds and influence them and their habitats.

Resources for this activity

Click to view and print these resources.



Groups of people and seabirds

Inquiry cycle

Vocabulary

Values, perspectives, interact, influence, beliefs, Aotearoa, conflict, mauri, kaitiaki, iwi, tangata whenua, endangered, fishers, populations, role, community, responsibility, stable, threatened, involved, research, coast

Groups of people and seabirds

Review the learning so far in your inquiry.

If it is relevant to the inquiry, discuss how people are involved with seabirds.

Brainstorm examples of groups of people who deal directly with seabirds (e.g. fishers) and those who make decisions that influence seabirds e.g. Ministry of Fisheries.

Explain that the first people in New Zealand to interact with seabirds were Māori. They had their own ways to maintain balance within the environment.

One of the concepts which helped them with this is mauri. Introduce the idea of mauri and how it relates to the health or life-force within an ecosystem (see teacher notes). Explain that Māori believe that this life-force also connects plants, animals, people and the environment. Other groups have other beliefs and systems.

Also discuss the concept of kaitiaki - a person, group of people or other who guards the mauri of a place and provides care and protection. How do iwi in your area help to maintain mauri?

Many other groups of people are now involved with seabirds in New Zealand. **Groups of people and seabirds** could be used to investigate examples of groups who are involved with seabirds. Students could be given a group from 2.1 to focus on, individually or with others. You may also wish to provide props for each group such as a fishing line, mauri stone, scientific bird bands etc...

Alternatively, students could focus on and research specific groups relevant to your community and the seabirds within it (see below).

Values and perspectives

People act according to their values and beliefs. Introduce the vocabulary: Values and perspectives (see teacher notes).

In groups, students could then use one of the featured groups to examine:

How does this group view and use the ocean or coast?

How would the group interact with and/or affect seabirds?

What might the values of this group be? How could these values affect a groups' decisions? (Give students a list of values from the NZ curriculum to use as examples if needed- see teacher notes).

Groups could then present or share their ideas.

A local context

At this point, students could focus more on a specific local context. This could be a well-known coastal place in your area. Students could then discuss how their group might view (think about/ value) and use this place. How would their use of the place influence seabirds?

Students could then write from the perspective of their group, explaining their views and how they influence seabirds.

This could be a letter, including:

- Can you see opportunities for your group to work with others?
- What could cause conflict between the groups?
- How could they resolve these conflicts?

Reflect on the learning

What did we find out? Do we need more information?

How could students themselves influence seabirds in their local environment? List any questions that arise for follow up later in your unit.

Extension/ further learning

Invite guests from your community who are involved with seabirds to speak to your students about how they interact with other groups to help seabirds.

Investigate examples of how groups of people and seabirds are sharing their environment (sea and land) without conflict. What have people done in order to achieve this?

What could groups of people achieve in your local environment? Use role-play to hold a fictional community meeting about an issue that would affect multiple groups, e.g. coastal development. Discuss what could be done by working together to encourage positive change. What would need to change? What would it look like?

Build on an idea which arises from the fictional community meeting. This could be part of your future action (see Activity 9).

ACTIVITY 6:

Threats to seabirds



TEACHER NOTES

This learning experience introduces the major threats to seabirds and helps students to refine their inquiry and identify a focus seabird.

Curriculum links

Achievement objectives

Social Sciences: Level 3 and 4

Social Studies L3

Understand how people make decisions about access to and use of resources.

Social Studies L4

Understand that events have causes and effects.

Science capabilities:

Gather and interpret data, Engage with science.

Learning intentions

Students are learning to:

- Understand the major threats to seabirds and how people are involved.
- Explore specific threats to a focus seabird.

Other curriculum links in this activity:

Science: Nature of Science: Understanding about Science, Living World: Ecology.

Success criteria

Students can:

- Create a mind-map showing threats to seabirds and identify how people contribute to them
- Identify a focus issue for a particular seabird.

Background notes

What is a threat?

A threat is 'something that is likely to cause damage or danger'. Threats for seabirds are things that are likely to harm or kill them.

What are the major threats to seabirds?

Some of the major threats to most New Zealand seabirds are:

Climate change

Climate change is increasing the temperature and acidity of our oceans and the balance of life within them. These changes will eventually affect all animals within ocean ecosystems. Ocean warming will change the distribution of seabirds' food, intensify storms, and will alter seabird habitats, migration and breeding. Acidification of the oceans will also alter marine food webs, habitats and ecosystems.

Accidental catch by fishers

Commercial fishing is the biggest threat to many seabirds, including black petrels. Recreational fishing also has an impact on most seabird species. Birds swallow bait attached to lines and this can injure or drown them.

Introduced predators

Introduced predators are animals that were brought to New Zealand by people, such as: rats, cats, dogs, pigs, stoats and ferrets. These animals can kill seabirds, especially their chicks and eggs. Goats, rabbits and deer can also harm seabirds' habitat, which can affect their breeding.

Habitat loss and disturbance

Coastal development, weeds and changes in vegetation cover can disturb or destroy seabird habitat. Human disturbance can also affect seabirds' breeding areas.

Ocean pollution, rubbish and plastics

Pollution and rubbish cause problems for all life in the ocean, including seabirds. Plastic rubbish can look like food to seabirds and if they eat it, can harm or kill them.

Which threats most affect black petrels/ tāiko?

The main threat to black petrels is commercial fishing. The preferred foraging areas of black petrels/ tāiko, overlap with areas for snapper, bluenose and hapuka fisheries. If an adult dies, this has a large impact on the population. Adult petrels often have a chick that they are feeding, which won't survive by itself if the parent bird is killed. We also lose the potential/future breeding of the adult bird. Deaths from rats, cats, dogs and pigs (introduced predators) are a relatively small proportion of the annual deaths of black petrels. For more information on black petrel threats, refer to the [Black petrel PowerPoint](#) from Activity One.

Why should we care about seabird threats?

Seabirds occupy an important role in the environment. They provide important connections between land and sea, bringing vital nutrients from the ocean to nourish the land, plants and animals. They move soil around with their burrowing. They also play a part in providing balance within ocean ecosystems. Many threats to seabirds are also threats to other native and endemic animals.

ACTIVITY 6:

Threats to seabirds

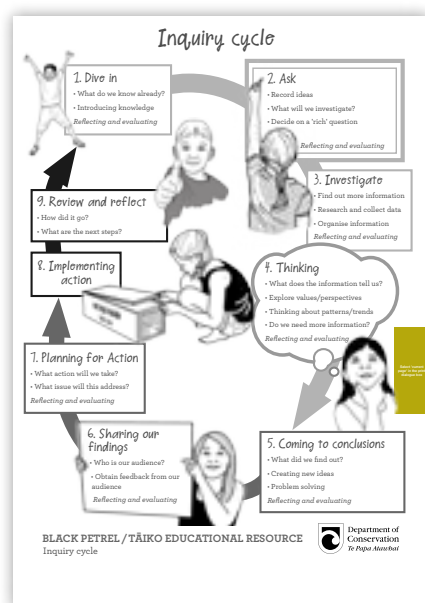


LEARNING EXPERIENCE

Focus questions: What are the major threats to seabirds?

Resources for this activity

Click to view and print these resources.



Inquiry cycle

Inquiry notes

Vocabulary

Threats, protection, predator, introduced population, risks, development, native, scientist, issue, climate change, pollution, biosecurity, disturbance, diversity

Threats to seabirds

What is a threat? Encourage students to have a quick chit-chat about what they understand a threat to be, then share ideas.

Will threats be the same for every species of seabird? Threats to different species of seabirds depend on a variety of factors. The behaviours, habitats, life cycles and other aspects of each species, influence which threats will most affect them.

What kinds of threats were brought with people to New Zealand? Ask students to consider this and then share ideas, through think, pair, share / walk, pair, share or a talking donut.

Investigating threats

Specific threats to seabirds could be explored further using the following resources:

Fishing

Taking the bait: Connected L4, 2012 p24

Forest and bird video - [How to safely fish and not attract seabirds](#)

Pests and biosecurity

It seemed like a good idea at the time: Connected L3, 2011 (Border security)

Climate change, pollution and changes in our oceans

For some species, climate change and pollution are the biggest threat.

Watch [The decline of subantarctic wildlife](#) (suitable for level 4+ as it contains challenging scientific vocabulary) (7m 20s)

Rubbish and habitat disturbance

The Department of Conservation presentation, [Giving the ocean a voice](#), explores observations of the Pacific Ocean from a scientist aboard a waka.

[NIWA: Seabird diversity in the southern ocean](#) (9m 17s). This video clip also explores human-induced threats to a variety of seabirds.

Organising information about threats

After investigating a variety of threats, create a mind-map of the threats which affect seabirds, using a digital tool such as: [popplet.com](#) or [coggle.it](#)

Looking at the mind-maps- What are the main threats for seabirds? Is there a relationship between threats? What does the information tell you?

How have people been involved in causing threats to seabirds? (see Activity 5). What has influenced their decisions or actions?

Students could then investigate how they are personally/ collectively contributing to the threats above and record ideas on further branches of the mind-map

Extending your inquiry

Choose a focus seabird to investigate

Students have now been introduced to a variety of seabirds, including: black petrels/ gannets/ little blue penguins/ red-billed gulls. In order to focus their inquiry, create more meaningful action and increase lasting understandings, students should choose one seabird to further investigate for the rest of the unit. This should be a seabird which they have already come across during their inquiry, and one which is ideally living near your community, so that they can be investigated and observed during the visit in the following experiential Activity 7.

Identify the threats that affect your focus seabird

Now that you have identified a focus seabird, discuss all that you know already about this seabird – what are their: habitats, adaptations, migration patterns and/or challenges? This knowledge could be recorded using a mind-map or other digital representation such as a slideshow or web page.

Considering what you have found out about how this seabird behaves and lives- what are the needs of this seabird? What obstacles are there for this bird meeting its needs in your local environment?

Which threats might affect this seabird?

Compare these threats to the threats noted for all seabirds on the mind-maps. Are these threats the same or different? Why?

Identifying a focus issue for the seabird

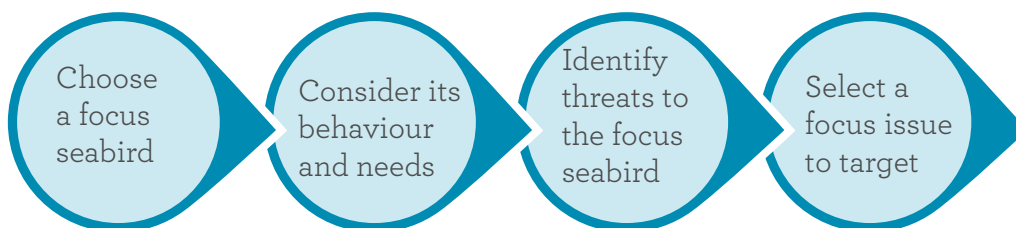
From the mind-map of threats, students can choose a particular focus issue for this particular seabird, which they can take action to minimise or resolve. Focus on the most serious and captivating problem that they would like to solve (which they will be able to influence and contribute to).

Student inquiry notes is provided as a tool to develop the students' inquiry. Record ideas and inquiry notes on this template to guide the rest of the inquiry.

Why should we care about seabird threats?

Why should we care about the survival of this species of seabird? What would happen if this species became extinct because of the various threats in their environment? What impact would this have on other species?

Do you care about seabirds? Are they important? Why? This could be developed through writing an argument/ persuasive writing or a debate.



Reflecting on our values

Which values are relevant to this seabird and the issues surrounding it? Revisit the values from Activity 5 and see which ones apply to this situation.

What are your values as a community? How might these values influence your decisions?

Record relevant values on 2.2. Student inquiry notes.

Reflecting on our learning

What have students found out so far about threats to seabirds? How have people been involved in these threats?

Do you have any further questions? How could you find answers to your questions?

Extension/ Further learning

Create a time-line of events that shows the development of a threat for your focus seabird. Include the causes and effects.

Further investigate the current situation for the focus seabird through your seabird experience in Activity 7. Do you need more information? Where could you find this information?

ACTIVITY 7:

Experiencing seabirds in their environment



TEACHER NOTES

This learning experience introduces the major threats to seabirds and helps students to refine their inquiry and identify a focus seabird.

Curriculum links

Achievement objectives

Sciences: Level 3 and 4

Ask questions, find evidence, explore simple models and carry out appropriate investigations to develop simple explanations.

Nature of Science: Understanding about Science

Identify ways in which scientists work together and provide evidence to support their ideas

Health: Personal Health and Safety Management

Identify risks and their causes and describe safe practices to manage these.

Science capabilities:

Gather and interpret data, Engage with science.

Learning intentions

Students are learning to:

- Find evidence to support or challenge their ideas about their focus seabird.
- Reflect on their experiences to develop simple explanations about their observations.

Success criteria

Students can:

- Record observations and find evidence to support or challenge their ideas about seabirds
- Write a report/ recount/ article to explain their observations and reflect on experiences

Other curriculum links in this activity:

Science: Nature of Science: Participating and contributing.

Background information

Scientists and seabirds

Scientists play an important role in seabird and ocean conservation. Their data can be used to make informed decisions about how we use and manage our resources such as fish stocks. Organisations such as universities, polytechnics, DOC, councils and others may employ scientists who carry out research on seabirds in your area.

Students as scientists

A site visit enables and empowers students to be 'real-life scientists'. Scientists make predictions and then test their predictions, by making observations, gathering and interpreting data, looking for patterns and trends, and critiquing their evidence. Students should be encouraged to engage in these science capabilities before, during and after the visit, as part of their inquiry. See: scienceonline.tki.org.nz

Bringing an authentic context to learning

A trip to visit seabirds brings an authentic learning context to your inquiry. This will be a great platform for meaningful follow-up action for the environment and also enables students to see, experience and understand seabirds in real-life and real-time.

Experiential learning

Experiential learning is a personal experience for a student where they explore a context that is relevant for them and then reflect on the experience. Teaching and learning can be developed through reflection on experiences.

For more information see: www.efs.tki.org.nz

What do schools need to consider before going on a seabird visit?

Teachers and students will need to consider aspects such as safety, student's needs, adequate supervision and equipment needed.

The EOTC (Education outside the classroom) pages on the [TKI website](#) are a useful reference for planning your visit. A safety action plan (SAP) or RAMS (risk assessment matrices) will need to be written to meet the requirements of your school. You will also need to consider what the purpose of your visit is and what the focus of learning will be. Students can complete their own SAP with support.

What teaching & learning could we focus on during a seabird visit?

The focus for your field trip will depend on your students' inquiry and what you are aiming to find out about the focus species of seabird.

Some examples are:

- Count numbers of birds (size of local populations)
- Observing and recording behaviour, special features or adaptations
- Recording where seabirds are living/ identifying which seabirds are present in an environment
- Tracking pests present in an area where seabirds breed
- Count numbers of young seabirds present at end of the breeding season to see if breeding was successful

ACTIVITY 7:

Experiencing seabirds in their environment



LEARNING EXPERIENCE

Focus question: What evidence can we find to deepen our understanding about our focus seabirds in their environment?

Resources for this activity

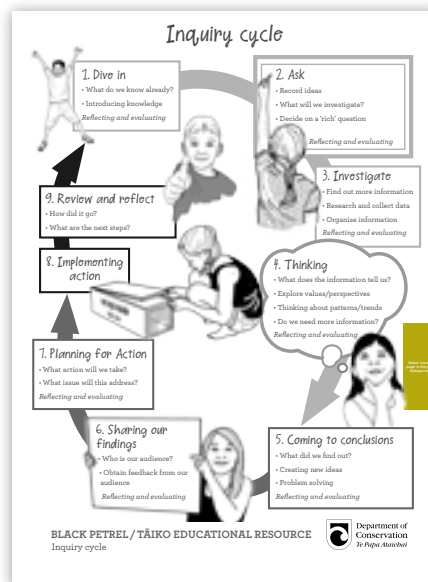
Click to view and print these resources.



Takeaway table: Connected: L2, 2013



An ecologist on ice: Connected, L4: 2013



Inquiry cycle

Student inquiry notes

- 1. Dive in**
What do you already know about these birds?
- 2. Ask**
What do you want to know?
- 3. Investigate**
Focus seabird!
- 4. Planning for action**
What action will you take and why?
- 5. Coming to conclusions**
What have you learned? What conclusions have you come to?
- 6. Sharing your findings:**
How will you share and present your findings?
- 7. Thinking**
What will you investigate?
- 8. Implementing action**
- 9. Review and reflect**

BLACK PETREL / TĀIKO EDUCATIONAL RESOURCE | Department of Conservation | Te Papa Ihaka

Student inquiry notes

Vocabulary

Experience, evidence, observations, safety, issues, safety action plan, scientist, critique, location, monitor, population, requirements, variables, behaviour, support, challenge.

Scientists and seabirds

How do scientists learn about seabirds? Discuss the methods scientists use to gather data, e.g. behaviour observation, data collection and population surveys.

View an example of how scientists find evidence to support or challenge their ideas such as [An Ecologist on Ice](#). This article provides an example of how scientists gather and interpret data about Adélie penguins. Research methods for gannets are discussed in [Gannet research](#).

After viewing, discuss why observations and data are important for scientists. How can science affect how people use land and resources such as fish stocks? Think, pair, share ideas. Record ideas about why observations and data are so important.

Examine your inquiry questions and [Student inquiry notes](#) to see if there are any ideas that could be investigated during your seabird visit. Discuss how these ideas could be explored by visiting a seabird colony. What evidence could support or challenge your ideas?

What could you learn from watching the birds' behaviour and from observing their habitat? How could this information be important?

Prior to your seabird visit

Use your knowledge of how scientists learn about seabirds, to plan a focus for your trip, identify what ideas or issues you will investigate and what kind of evidence you will be looking for.

View [Takeaway table, Connected L2, 2013](#), for ideas about student observations, focus ideas and notes. Decide on a format for recording observations and evidence during the visit, e.g.: observational drawings/ taking photos or video/ making notes.

If necessary, assign groups to various ideas/ issues and recording methods.

Safety considerations for EOTC

Together with students, create a safety action plan (SAP) for the visit, using the tools on this MOE (EOTC) website: www.eotc.tki.org.nz

What equipment will be needed?

How can you minimise any risks or hazards at the location you are visiting?

How can we keep each other safe? What will we do if something goes wrong?

For the teacher: Are there any special needs requirements (medical/ behavioural or learning needs) in your class? How will these be catered for during the visit?

During your seabird visit

Aim for students to think and behave like scientists for the day.

Record any evidence to support or challenge your ideas, in the format that was decided before the visit.

Students could also record species found, observations, and numbers present on an app such as iNaturalist/ NatureWatch or on the website: naturewatch.co.nz

Take photos on a camera or digital device to record and remember the experience.

Look for potential issues for the birds while you are in their habitat. These might be obstacles to meeting their needs, e.g. introduced predators, human disturbance, changes to habitat.

Is there a reason you visited this particular site? Look at the site from a seabird's perspective and record observations. What other places might these seabirds visit?

Ensure you follow the EOTC guidelines for safety management and during your visit.

After your seabird visit: reflecting on our learning

Reflect on the experiences during your visit. Share the evidence you found to support or challenge your ideas.

Were any of your inquiry questions answered from your observations or evidence? What did you find out? How can you explain your observations?

Did you come across any issues for seabirds during your visit? Use **De Bono's hats** to encourage deep thinking about these issues.

Critique the evidence to make sure it is reliable. What other information is available to support your ideas? Students could research other findings in order to support or challenge their own observations.

To summarise your discoveries, write either recounts or reports about your visit. For younger students, work together to collate their observations and evidence into a shared document.

Extension

Citizen Science is becoming a popular way for the whole community to be involved in scientific monitoring. It can include community monitoring and recording of populations of animals. See: www.sciencelearn.org.nz/

How could citizen science be applied to your focus seabirds? Students could create a monitoring project for community members and trial it with their community. This could be supported by other organisations such as community groups, universities or conservation groups.

Take your ideas a step further with your action in activity 9, for example, monitor pests in an area, and then plan to explore what could be done about those pests, using local expertise and resources. For example the Hutton's shearwater project. www.kcc.org.nz

Options for visiting seabirds*

*NB: The following is not a complete list of NZ seabird experiences. There may be other, more appropriate options available in your area. Seabird tours are not always available year round- enquire with the local tour operators/ departments about the best time to visit.

Black petrels/ Tāiko

Glenfern Sanctuary, Great Barrier Island, Auckland

09 429 0091

www.glenfern.org.nz

Mt Hobson/ Hirakimata, Great Barrier Island, Auckland

Black petrels are difficult to see on a day trip, therefore it would be best to stay at the Mt Heale hut for a night,

and time the trip with Wildlife Management International workers, who carry out the monitoring on behalf of DOC (the breeding season is from around October- May)

Contact the local DOC office on 09 429 0044 for more information.

Gannets/ Tākapu

Muriwai Gannet colony, Auckland

Take a self-guided tour to the gannet colony at Otakamiro Point at the southern end of Muriwai beach.

For more information see: www.aucklandcouncil.govt.nz and www.newzealand.com

Gannet Beach Adventures, Cape Kidnappers Gannet Colony, Hawkes Bay

Guided tours to the gannet colony at Cape Kidnappers. For information and school bookings contact: info@gannets.com

www.gannets.com

Little blue penguins/ kororā

Miramar peninsula and Tarakina Bay, Wellington

For more information see: www.forestandbird.org.nz

West Coast, South Island

Look for little blue penguin tracks on west coast beaches.

For information see: www.bluepenguin.org.nz

For information on other west coast seabirds, see the West Coast Penguin Trust's website:

www.bluepenguin.org.nz

Pohatu Penguins, Akaroa, Canterbury Region

Contact: tours@pohatu.co.nz

www.pohatu.co.nz.

Black Cat Cruises, Akaroa, Canterbury Region

Akaroa Harbour nature cruise- a variety of seabirds including little blue penguins

www.blackcat.co.nz

Blue penguin colony, Oamaru, Otago

The Pukekura Trust

www.penguins.co.nz

Tickets and information available from Royal Albatross Visitors Centre, Otago. An accessible little blue penguin colony, where students can observe penguins coming in at night or view information about them and learn about penguin rehabilitation during the day.

Taiaroa Head/Pukekura, Otago

www.doc.govt.nz

A variety of seabirds can be seen here, including little blue penguins and royal albatrosses.

Red-billed gulls

Red-billed gulls can be found in most coastal areas in New Zealand. They breed on eastern coasts of the North and South Islands on stacks, cliffs, river mouths and sandy and rocky shores.

Sulphur Bay, Lake Rotorua

Colonies of shags and red-billed gulls (free)

Kaikoura Peninsula

Nesting colonies of gulls and terns

Other seabirds and shorebirds

Miranda Shorebird Centre, Waikato

A centre dedicated to shorebird education and observation, including bird hides, guided tours and information.

www.birdingnz.co.nz

www.tvnz.co.nz/meet-the-locals

Ambury Regional Park, Mangere, Auckland

Wetland ecosystem programme (For Years 5-8).

Phone 09 301 0101 or visit www.aucklandcouncil.govt.nz

A programme about shorebirds and the part they play in the wetland ecosystem.

Sulphur Bay, Lake Rotorua, Rotorua

Colonies of shags and red-billed gulls (free)

Manawatu Estuary, Manawatu

A variety of seabird species. A site for migrant shorebirds and overwintering seabirds (gulls and terns) to roost. Easy access. Look for banded birds here and observe the foraging behaviour and interactions of various seabirds and shorebirds.

www.doc.govt.nz

Kaikoura

See a range of seabirds including albatross, petrels, shearwaters, shags, terns and gulls.

www.albatrossencounter.co.nz

Ōtamahua/Quail Island Recreation Reserve, Canterbury

A variety of seabird species.

www.doc.govt.nz

No time for a trip? Try www.learnz.org.nz for a virtual trip experience.

ACTIVITY 8:

Protection of seabirds



TEACHER NOTES

This learning experience explores how seabirds can be protected and summarises the current situation for a focus seabird.

Curriculum links

Achievement Objectives

Science: Levels 3 and 4

Nature of Science: Participating and contributing

Use their growing science knowledge when considering issues of concern to them.

Social Sciences: Levels 3 and 4

Social Studies L3:

Understand how people make decisions about access to and use of resources

L4:

Understand how people participate individually and collectively in response to community challenges

Science capabilities:

Use evidence, Critique evidence, Engage with science

Learning intentions

Students are learning to:

- Understand the major threats to seabirds and how people are involved.
- Explore specific threats to a focus seabird.

Success criteria

Students can:

- Record ideas about how and why seabirds are protected and how people are involved
- Investigate actions that will address an issue for seabirds

Other curriculum links in this activity:

Science:

Speaking, writing, and presenting

The arts:

Visual Arts

Background information

What can be done to protect seabirds?

Groups of people all over New Zealand are working to gain more protection for seabirds and reduce the issues and risks for them. Many of our seabirds are likely to become even more threatened if more is not done to help them.

Seabirds are legally protected in New Zealand under the Wildlife Act (1953), which means it is an offence to hunt or kill them.

Some examples of what can be done to protect seabirds include:

Protecting seabird habitat

Sanctuaries or marine reserves can be created and maintained, where seabirds are protected. Reducing coastal development in areas where seabirds and shorebirds breed will also help to safeguard some species.

Reduce plastics use

Plastics are a major threat to many seabirds. The best solution to this problem is to avoid using and purchasing plastics. Ensure that any used plastic is recycled (if possible) or disposed of correctly. For more information see reading resources.

Minimise greenhouse gas emissions

Climate change has a huge impact on our oceans. We can reduce our contribution to climate change through using more sustainable transport options, reducing energy use and composting our food waste.

Pest management

People can monitor and control introduced predators and pest plants.

Fishing using 'seabird safe' fishing guidelines

Fishers can follow seabird safe suggestions for fishing to reduce the likelihood of catching a seabird.

Fishing boats can avoid attracting seabirds by:

- keeping bait and burley covered
- sinking bait fast out of sight
- weighing down burley and lines with sinkers
- using soft baits

Education and outreach

Education can help people to understand how everyone can help seabirds. Schools and communities can take a lead role in informing and involving their communities to reduce the threats to seabirds in their local area.

What could safe habitat for seabirds look like?

Safe habitat for seabirds would have few pests, weeds or introduced predators present, little human disturbance and minimal pollution. It would be a substantial area, not accessible to threats and with plenty of habitat suitable for seabirds.

Reserves and protected areas provide safe habitat for some of New Zealand's most endangered species, including seabirds.

What is kaitiakitanga?

Kaitiakitanga is a way of thinking about and looking after the environment in order to help maintain the balance of everything within it. It can be loosely translated into English as protection or guardianship. Kaitiaki are people who protect and look after an area's resources and act to restore ecosystems through a holistic approach, recognising that all things are interconnected.

What is future problem solving/ future-focussed learning?

When participating in future problem solving, students will use a range of thinking skills such as creative thinking to solve problems in a future-based context. See: nzcurriculum.tki.org.nz/Principles/Future-focus. The future focus principle looks to the future.

Taiko climbing launch rock,
Aotea/Great Barrier Island.
Photo credit: Dave Boyle



ACTIVITY 8:

Protection of seabirds



LEARNING EXPERIENCE

Focus questions: How can seabirds be protected? How can we be involved in their protection?

Resources for this activity

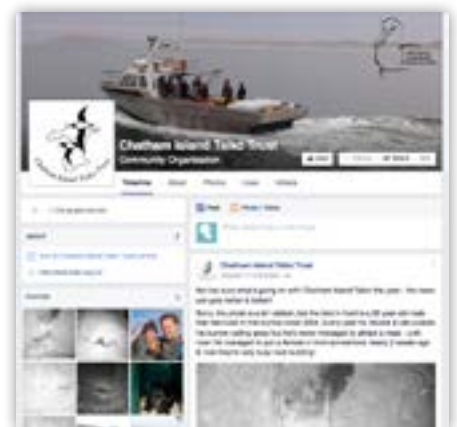
Click to view and print these resources.



TVNZ Meet the locals: Hauturu Living Jewel



Yellow-eyed Penguin Trust website



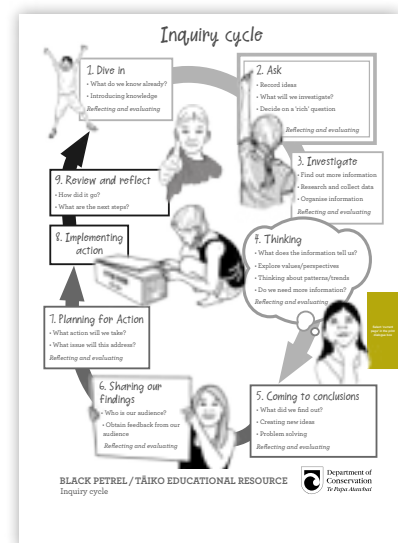
Chatham Island Tāiko Trust website



TVNZ Meet the locals: Taiaroa Head Seabirds



Hutton's Shearwater Charitable Trust website



Inquiry cycle

Vocabulary

Situation, protection, ecology, presentation, population, development, native, sanctuary, reserve, future, issue, kaitiaki, kaitiakitanga, mauri, outcome

Safe habitat for seabirds

What would a safe habitat for seabirds look like? Brainstorm and record ideas. Students could begin to record their ideas about safe seabird habitat through a wall mural, artwork or digital presentation. The artwork could reflect an example of seabird habitat in a protected environment or reserve.

Watch one or both of the following mini-documentaries to see examples of protected environments for seabirds. During viewing, ask students to think about what these environments would be like for seabirds such as black petrels, little blue penguins, gannets and red-billed gulls.

Taiaroa Head: Long-term protection of seabirds (including red-billed gulls, little blue penguins and albatrosses) (4m 14s)

Taiaroa head is a mainland sanctuary in Otago which is home to many species of seabirds.

Hauturu living jewel: island sanctuary (4mins)

Little Barrier Island/ Hauturu o Toi, New Zealand's first nature reserve, is a haven for species such as black petrel/ tāiko. This clip gives us a glimpse at what New Zealand might have been like before people arrived.

Reflect on what the two sanctuaries above have in common, and what life might be like within them.

Why do people currently need to help to create safe habitat for seabirds?

Students could continue to add ideas to their display/ presentation, about why sanctuaries or managed areas are often necessary for seabird survival and how different people have been involved in establishing them. Use various sources of information and include both text and images to represent ideas. Students can find information about how groups around New Zealand are restoring seabird habitats, see links in resource list above.

The current situation for your focus seabird

Review information from Activity 6: Threats to seabirds.

What protection is currently present for your focus seabird in your community? This may involve government organisations, not for profit groups, iwi, volunteer groups, schools or other people.

Explore the concept of kaitiakitanga (protection/ guardianship). How can people be involved in restoring mauri to an area? Kaitiakitanga involves looking at the interconnectedness of the environment, people and other aspects. What other factors are influencing the habitat, safety and mauri of your local environment?

Review your completed [Student inquiry notes](#) and discuss the focus issue.

ACTIVITY 9:

It's time to act for seabirds



TEACHER NOTES

This learning experience supports you and your students to help tackle an issue that affects seabirds. It's time for students to apply their knowledge, skills and values to solve a real-life issue of concern.

Curriculum links

Achievement Objectives

Science: Levels 3 and 4

Nature of Science: Participating and contributing

Use their growing science knowledge when considering issues of concern to them.

Technology: Technological practice-Brief development and evaluation:

Describe the nature of an intended outcome, explaining how it addresses the need or opportunity. Describe the key attributes that enable development and evaluation of an outcome.

Science capabilities:

Use evidence, Critique evidence, Engage with science

Learning intentions

Students are learning to:

- Plan for action that will target an issue for seabirds
- Carry out informed, meaningful action for seabirds
- Evaluate the success of your action

Success criteria

Students can:

- Record ideas about how and why seabirds are protected and how people are involved
- Investigate actions that will address an issue for seabirds

Other curriculum links in this activity:

Science:

Speaking, writing, and presenting

The arts:

Visual Arts

Background information

Why is taking action important?

After identifying a focus issue and creating innovative solutions during their inquiry, it is important to enable students to follow through to act on these ideas in order to make a real difference for seabirds. Education for sustainability has three dimensions: about, in and for the environment. Informed, targeted action is a key component of education for a sustainable future.

How can we as schools target an issue for seabirds?

Often it is not possible to tackle an entire large issue as a small group of people, but if an issue is broken into parts it will be more achievable to address part of the problem.

Explore an aspect of an issue that involves a community influence. Schools can work to educate, inspire and motivate their communities to act. See the examples in reading resources.

Planning for action

Environmental action should be a result of your inquiry during this unit. The action should ideally target an issue which arose during your teaching and learning.

Deciding on how you will help

Students need to be at the centre of decision making, to ensure that they are empowered to make a real difference. This will increase their motivation and enthusiasm for the action project. A decision making tool such as decision making grids and PMI (plus, minus, interesting) charts may help to select which action will best address an issue. An aim of education for sustainability is that the students are motivated to take action for their own reasons. Inspired students taking action can be powerful and humbling to witness.

Who could be involved?

When designing a project, it is important to consider who could be affected by your choices and also who might be of help and/or want to be involved.

Working with other people outside the school can reduce the load on staff and students and can also make valuable, long-term connections between you and your community. If you are setting up a partnership, ensure you give clear guidelines and define timelines, roles and responsibilities. Make sure you have agreed stages of the project and communicate regularly. This can avoid difficulties later on. Funding help may also be available through your local council or other relevant agencies.

Monitoring and reflecting on change

It is important to include a process for monitoring results and measuring change when planning for action. This information will be useful for future funding applications and for reporting purposes. Include an opportunity to reflect on the changes that have occurred as part of your project. Record the reflections. These can be useful to refer back to when working on future projects.

ACTIVITY 9:

It's time to act for seabirds



LEARNING EXPERIENCES

Focus question: How will we achieve our action for seabirds?

Resources for this activity

Click to view and print these resources.

The form is titled "Seabirds: What is the same? What is different?". It features a flowchart with two boxes at the top, arrows pointing down to a central box, and two arrows pointing down from the central box to two separate boxes. Below the flowchart is a section for "Thinking: Are these seabirds similar or very different? Why?" with a text area. At the bottom is a section for "Other questions" with a text area. The footer includes "BLACK PETREL / TĀIKO EDUCATIONAL RESOURCE" and the Department of Conservation logo.

Brief

The form is titled "Action plan" and includes the instruction "Use this template to help you to plan for action for seabirds". It starts with a box for "The BEST future we can imagine — what is it like for this seabird?". Below this are sections for "What are we going to do?" (Action), "When", and "Who". The "Action" section includes a list of steps (1-4). The "When" section includes questions about start and finish times. The "Who" section includes questions about who to talk to, who to involve, and who to ask for help. To the right of these sections is a table for "What?" with columns for "What we need" and "Cost". The footer includes "BLACK PETREL / TĀIKO EDUCATIONAL RESOURCE" and the Department of Conservation logo.

Action Plan



Example PMI chart

Vocabulary

Action, outcome, obstacle, kaitiakitanga, whanau, community, mauri, brief, criteria, reflection, evaluation, decision, interconnected

Introduction to action

Revisit the concept of kaitiakitanga. Identify how students could be involved with kaitiaki in your community.

Discuss the focus issue, current situation and possible actions from learning experience 8. How can you act to help to create the best future for your focus seabirds?

An action should make a difference for a focus issue and contribute to the best future you can imagine. Remind students of the focus issue from learning experience 8. This may be an issue such as:

- Plastics in the ocean *

- Climate change*
- Introduced pests on island sanctuaries *
- Or another issue relevant to your community

* see recommended resources list links at the beginning of this section

See the following examples and the reading links for inspiration and more ideas. These are really motivating!

Oakura School: Helping little blue penguins

Mangawhai School: Helping the fairy tern

Deciding on an action

Revisit the list of possible actions from learning experience 8. How will you use your knowledge and skills to take action for seabirds?

Make a PMI (plus minus interesting) table or similar evaluation tool for each option. Identify which action will have the most positive outcomes and the fewest potential obstacles/ problems.

Alternatively, use a decision making tool such as ‘decision making grids’ to help to make a choice.

Students can then decide on an option for action. Why are you choosing this action? What will the action achieve for seabirds? Does the action align with your values? What difference will it make to your focus issue?

Planning for action

Creating a brief

What is a brief? A brief explains what is going to be done and why.

It includes criteria. A brief tells you what the action will look like and how it will function. Completing a brief will help the action to be well-planned and effective. Criteria are points that tell you what your action will include.

Complete [the brief](#) either individually, in groups or as a class, to ensure your action will address the focus issue and to identify what the action will involve.

Who will we work with?

Who can support you to help seabirds?

Kaitiaki work collaboratively and co-operatively and are interconnected with other groups of people, the environment and to other objects and living things. To restore mauri to an area, you must look at this bigger picture and ideally involve local iwi in your plans, to ensure that meaningful and appropriate action is taken.

Who do you know in the wider community that could assist with your project? At your hui/ presentation/ sharing (during learning experience 8) did you identify any potential partners for action? If you are unable to find someone in your community, you could try someone within your school, such as another class or a staff member. Alternatively, you could look for appropriate support online, on networking sites or conservation hubs such as Forest and Bird, local restoration/ recreation groups and naturespace.org.nz.

Consider factors such as: Who could add value to your action? Are there people in the wider community who have strengths that would enhance your action? How could you add value to another project already up and running?

Complete [the Action Plan](#) to guide you through planning (the who, what, why, where and how) of your action for seabirds.

Seek advice from relevant agencies and other schools to benefit from their experience during the planning stage.

Let's act for seabirds!

Carry out your action.

Go for it! You can make a difference!

Remember to take photos and record your actions as you go, for later reflection, sharing and measuring.

Measure against your criteria to monitor action as you go.

After the action

These questions could be presented as a bus stop activity, used in group discussions or distributed through google docs:

- How did our action address the issue we are concerned about?
- Did we achieve what we set out to do?
- What did we do well?
- What challenged us?
- What surprised us?
- What didn't we do?
- What would we do differently next time?
- What things were exciting and fun for us?
- Who would we work with next time?
- How will we continue to involve whānau and the community in our action?

Reflecting on your learning

- What did you learn from completing this action?
- Was there a learning gap?
- Make notes and keep for your records and assessment.

Measuring and monitoring the action

- How will you maintain and monitor your action project?
- How did you measure change resulting from your action?
- Look at your brief to see if you met the criteria for action. Did you achieve what you hoped to achieve?

- Work with other schools in your area to create far-reaching actions
- Enter a competition such as 'Global Issues Problem Solving'- see www.fpsnz.co.nz
- Contact the local media or write about your experiences to spread the word about your action and inspire others
- Don't stop there! Take more action for seabirds! What could you do to build on your success?

Extension/ Further learning

- Work with other schools in your area to create far-reaching actions
- Enter a competition such as 'Global Issues Problem Solving'- see www.fpsnz.co.nz
- Contact the local media or write about your experiences to spread the word about your action and inspire others
- Don't stop there! Take more action for seabirds! What could you do to build on your success?

TREASURES OF THE HAURAKI GULF MARINE PARK

Black Petrel - Tāiko: Very special, nationally significant qualities are recognised in the designation Hauraki Gulf Marine Park. Among these features is one of the most diverse and abundant seabird populations in the world. About 24 species breed around the Hauraki Gulf, gulls, terns, gannets, penguins and shags and the less familiar shearwaters, petrels and prions. Surprisingly though, one of the Gulf's most iconic seabird residents, the black petrel, has recently been identified as New Zealand's most at risk seabird from commercial fishing boats. Majestic in its wheeling flight over the ocean surface, the black petrel breeds exclusively on the Gulf's barrier islands, mainly on Great Barrier / Aotea.

Overall the population of black petrels is about 5,000 birds including 1300 breeding pairs on Great Barrier / Aotea and 100 pairs on Little Barrier / Hauturu.

Black petrels can cover amazing distances – the longest recorded foraging trip from Great Barrier / Aotea is 6601 kilometres in 25 days.

The black petrel (*Procellaria parkinsoni*) is also known as the Parkinson's Petrel. It is dark blackish-brown except for pale sections on bill. Adults weigh about 700g with a wingspan of 110cm.

Over winter black petrel adults and fledglings migrate to the coast of South America between Mexico and Peru and the Galapagos islands. Only 50% of fledged chicks survive this first year. Juveniles remain at sea in the West Pacific for two to four years until they are ready to breed. Survival rate is 46% during this time, increasing to 90% for birds over 3 years old.

Black petrels will aggressively follow fishing boats and may dive up to 20m below the surface after baits. Birds may drown taking longline hooks when they are being set or pulled onto boats.

Recreational fishers can play their part by keeping bait and offal covered and not discarding it, ensuring bait sinks rapidly, and by deterring seabirds like black petrels from hanging around boats with a hose or toy water gun. If birds become too aggressive, move location. A safe seabird release guide is available at www.southernseabirds.org

Inshore snapper and bluenose bottom longline boats pose the greatest risks to black petrels, especially where fisheries overlap with the foraging patterns of breeding birds. Less than 0.5% of boats in these high risk fisheries currently have observers on board.

Feral Cat

Nesting birds forage close to the Hauraki Gulf over the summer and autumn – mainly in the Tasman Sea and to the north east of NZ. They feed mainly at night.

Black petrels nest in burrows and can be seen waddling up the boardwalk tracks on Mt Hobson / Hiraikimata to their take-off spots from trees and rocks during the summer breeding season.

Around the main breeding colony on the peaks of Great Barrier / Aotea feral pigs sometimes dig up black petrel burrows and eat eggs and chicks. Feral cats and ship rats are present which also predate nests. Help keep the Hauraki Gulf pest-free, visit www.treasureslands.co.nz

Pacific rat Aotea

The black petrel is classed as vulnerable by the Department of Conservation and the IUCN's Red List.

Black petrel pairs share nesting duties, taking turns to incubate a single egg for about eight weeks until it hatches, and then feeding the chick for about 15 weeks until fledging.

The black petrel's main breeding area is around Great Barrier's highest peak, Mount Hobson / Hiraikimata. It was once found throughout the North Island and Northwest Nelson but predation by rats, mustelids, feral cats and pigs brought about its extinction there by the 1950s.

Giant weta Wētā punga

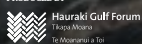
Research at Great Barrier / Aotea breeding colonies since 1995 indicates black petrels may be declining at a rate of at least 14% per year. At current survival rates, a fledged bird has a one in 20 chance of reaching breeding age (4+ years) and must breed 20 times successfully just to replace the current population.

Juvenile Black Petrel

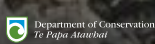
A new national plan of action for seabirds is being prepared by the Department of Conservation and Ministry for Primary Industries. To protect the black petrel better observer coverage, detailed bycatch prevention measures and agreed reduction targets are needed for the longline fishing fleet.

Pacific Gecko Papa

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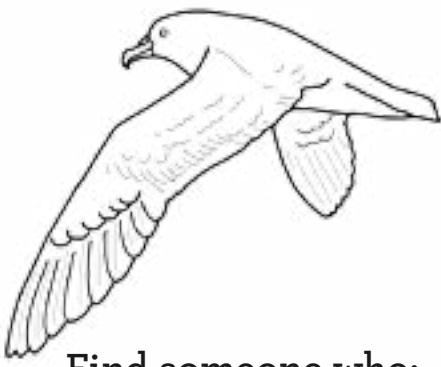


Project director: Tim Higham, Manager, Hauraki Gulf Forum | Art: Dave Gunson | Scientific advice: Biz Bell, Karen Baird and Chris Gaskin | Graphic Design: Kylie Hobert | Further information: *State of our Gulf, Te Ika-a-Moana - Hauraki Gulf State of the Environment Report 2011*, available at www.haurakigulforum.org.nz

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Sea bird bingo

Find someone who:

<input type="checkbox"/> Has heard of black petrels/ tāiko Name:	<input type="checkbox"/> Has seen a bird diving into the sea Name:	<input type="checkbox"/> Can spell 'petrel' Name:	<input type="checkbox"/> Can tell you something about black petrels Name:
<input type="checkbox"/> Can explain what a seabird is Name:	<input type="checkbox"/> Has visited an island where seabirds live Name:	<input type="checkbox"/> Can name another seabird Name:	<input type="checkbox"/> Has seen a black petrel/ tāiko or a similar bird Name:
<input type="checkbox"/> Has been in a forest Name:	<input type="checkbox"/> Can tell you where you might see a black petrel Name:	<input type="checkbox"/> Can tell you the Māori name for black petrel Name:	<input type="checkbox"/> Has seen a bird's burrow (or nest) Name:

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Recording knowledge

Name: Date:

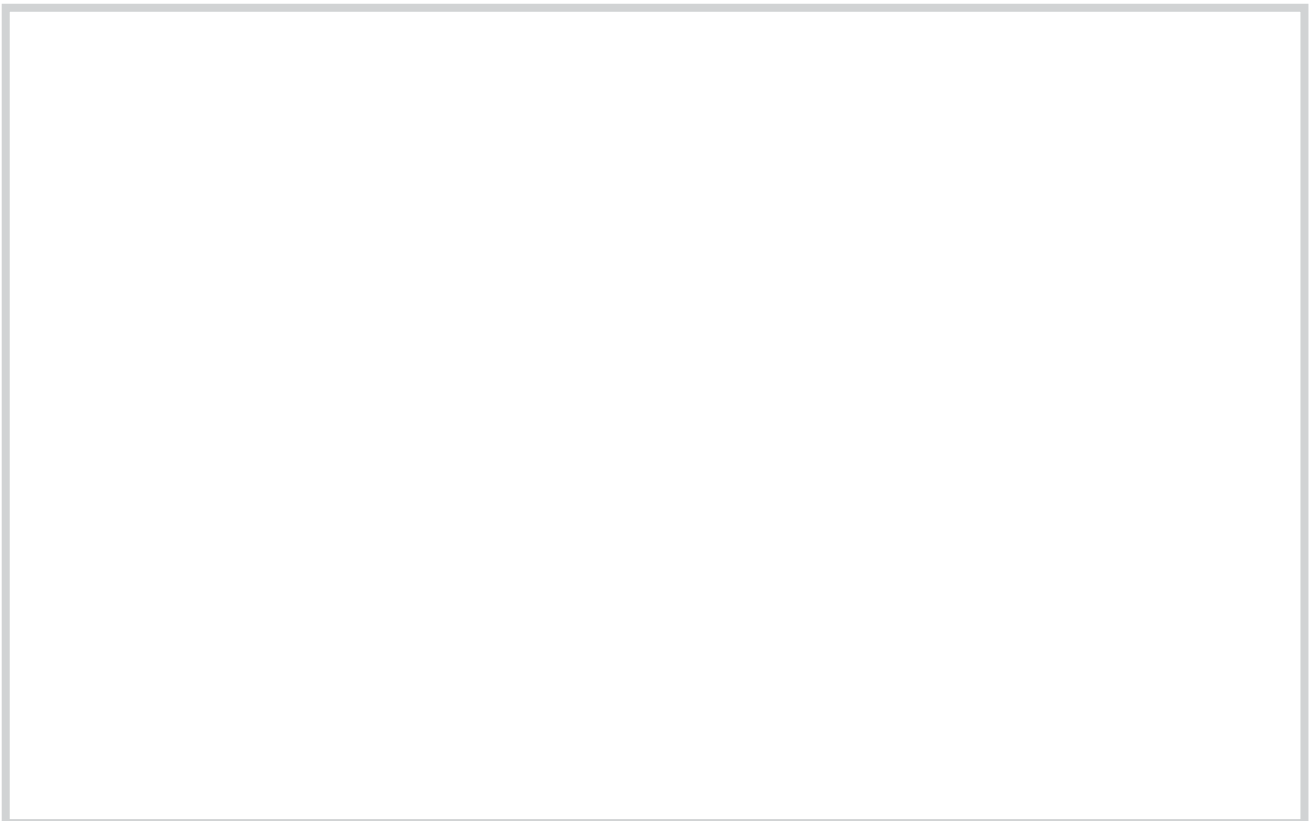
What I already know about black petrels/tāiko:

-
-
-
-

What would I like to find out about black petrels/tāiko?

-
-
-
-

My picture of a black petrel/tāiko (with labels)



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SEABIRDS OF THE HAURAKI GULF

This poster celebrates the species of seabirds confirmed breeding in or near the Hauraki Gulf Marine Park.



- 1. Australasian gannet *Morus serrator* Takapu**
89cm, 2.3kg | Breeds on Poor Knights (High Peak and Sugar Loaf Rocks), Maori Rocks (Mokohinau), Mahaki (Barkers Islands, Great Barrier), Gannet Rock (Waikato) and Monkakamarama (Coozemantle Island)
- 2. Buller's shearwater *Puffinus bulleri* Rako**
46cm, 42g | Breeds only at Poor Knights Islands
- 3. Flesh-footed shearwater *Puffinus carneipes* Teamui**
44cm, 60g | Breeds on Hen/Taranga and Chickens/Mauere, Mercury and some Coozemantle islands
- 4. Sooty shearwater *Puffinus griseus* Titi**
44cm, 80g | Breeds sparingly on a number of Gulf Islands
- 5. Fluttering shearwater *Puffinus guttata* Pakaha**
33cm, 30g | Breeds on Poor Knights, Hen/Taranga and Chickens/Mauere, Mokohinau, Little Barrier/Haururu, Channel and Mercury islands
- 6. North Island little shearwater *Puffinus assimilis haurakiensis* Pakaha**
30cm, 20g | Breeds on Poor Knights, Hen and Chickens, Mokohinau and Mercury islands
- 7. Black (Puckisson's) petrel *Pterodroma packardii* Taiko**
46cm, 70g | Breeds only on Great Barrier/Aotea and Little Barrier/Haururu
- 8. Grey-faced petrel *Pterodroma macropus gouldi* Oi**
41cm, 60g | Breeds on the majority of offshore islands (more than 2km off the mainland) in the Hauraki Gulf; also at some mainland sites (Tairāhema Regional Park)
- 9. Black-winged petrel *Pterodroma nigripennis***
30cm, 175g | Breeds only on Burgess Island in our region
- 10. Cook's petrel *Pterodroma cookii* Titi**
28cm, 20g | 19% per cent of the population breeds on Little Barrier/Haururu
- 11. Pycnonotus petrel *Pterodroma pycnonotus***
28cm, 16g | Breeds only on Mercury, Currier, Hen/Taranga and Chickens/Mauere and Poor Knights islands
- 12. New Zealand storm petrel *Pterodroma novaezelandiae***
18cm, 35g | Rediscovered in 2003, its breeding site has not been confirmed, but likely to be in the wider Hauraki Gulf region¹
- 13. New Zealand white-faced storm petrel *Pterodroma marina novaezelandiae* Takahikare-moana**
20cm, 45g | Breeds on Poor Knights and Mokohinau islands, also The Noises (Mariri/Ruapeke)
- 14. Northern diving petrel *Pelagodroma armitatoris* Kaaka**
20cm, 130g | Breeds on Poor Knights, Hen/Taranga and Chickens/Mauere, Mokohinau, Little Barrier, Tiritiri Matangi, Motouara, Channel, Currier and Mercury islands
- 15. Fairy penguin *Pachipelia taevah* Titi-waiwai**
25cm, 125g | Breeds only on Poor Knights Islands in our region
- 16. Northern blue penguin *Endipolus minor trossulus* Kaoroa**
40cm, 1100g | Most offshore and inner Gulf islands; some mainland sites
- 17. New Zealand fairy tern *Sterna nereis dubiae* Tara-ti**
25cm, 70g | Breeds at Takai Beach, Mangahāhi Head, Waipū Estuary (all mainland sites)
- 18. White-fronted tern *Sterna striata* Tara**
40cm, 160g | Breeds on some inshore and offshore islands (eg Mokohinau, Tiritiri Matangi); also many coastal mainland sites
- 19. Caspian tern *Sterna caspia* Tearami**
51cm, 700g | Breeds in coastal locations (eg Mangahāhi Spit, Whangape)
- 20. Red-billed gull *Larus scopulinus* Tarapunga**
37cm, 300g | Breeds on some inshore and offshore islands (eg Mokohinau, Tiritiri Matangi); also coastal sites
- 21. Black-billed gull *Larus dominicanus* Kaoroa**
60cm, 1050g | Breeds on some inshore and offshore islands (eg Mokohinau, Tiritiri Matangi); also coastal sites
- 22. Grey turnstone *Procelsterna cerulea albivittata***
31cm, 110g | Breeds in the Kermadec Group of islands and North Island but is a regular summer visitor to the Hauraki Gulf and can be seen at the Mokohinau and Poor Knights islands²
- 23. Pied shag *Phalacrocorax varius* Karuhirahi**
81cm, 2kg | Breeds coastally throughout the Hauraki Gulf's inshore and offshore islands
- 24. Spotted shag *Stercorarius punctatus* Parekaka**
70cm, 1200g | Breeds on some Coozemantle islands in our region.

WILDLIFE OF THE HAURAKI GULF MARINE PARK

The New Zealand Herald

¹ It is not known where the New Zealand storm petrel breeds. ² The grey turnstone is a regular sub-antipodal visitor.

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BLACK PETREL / TĀIKO EDUCATIONAL RESOURCE

Sea birds of the Hauraki Gulf



Department of Conservation
Te Papa Atawhai



Seabirds are among the most visible of marine lifeforms in the Hauraki Gulf Marine Park, here a huge flock of fairy terns and shearwaters feed on plankton in association with a school of trevally.

Photo © Jon Irvine

“In the late afternoon Cook’s petrels gather in large numbers within several kilometres of the island (Little Barrier/Hauturu). Many are grouped in nests resting on the sea, a good number are flying, but scything, arcing, flight so typical of gaudy petrels. Some indulge in display chases and calling. After dark they fly towards the island, their calls loud, amplified across the water, all the time orientating themselves towards their nest sites. Once over land their calls echo across valleys and ravines, giving scale to the darkened landscape. Sometimes, when it’s still enough, you can hear their wing beats, delicate like a hum. In the forest of kauri, beech, tauau, rata, the petrels enter the canopy or crash through small branches and leaves, sometimes landing with disarming stunts. On the ground birds shuffle across the forest floor, scrambling over obstacles, finding their burrows with remarkable certainty. Their night-time calling mixes with morepork, kiwi, kaka and sometimes tui, saddleback and hihi.”

chicks fledge, many travel across the Pacific Ocean but return to the Gulf to breed.

Islands and seabirds on the rebound

The sheltered coves and harbours of the Hauraki Gulf Marine Park make it an ideal place for sailing, motoring, fishing and other recreational pursuits. Many of the Gulf’s inhabited islands are close to the mainland. Others that are more remote, wild or uninhabited by humans are managed as nature reserves. The maritime world, particularly of the outer Gulf, is one in which the weather, sea conditions, tides and the patterns and presence of marine life are constantly changing. There is nothing tame about the marine park’s Mokohinau, Cuvier and Mercury Islands, Little Barrier Island/Hauturu – with its high-forested ridges, razorbacks and deep ravines – and the nearby Poor Knights and Hen and Chickens island groups.

The Gulf’s seabirds face dangers both on land and out at sea. Larger petrels and some shearwaters routinely get caught and killed in fishing gear, while on land seabirds like harriers, gulls, pukeko and weka.

The populations of petrels and shearwaters were once so abundant they provided important food for Māori, as they did for mariners and settlers elsewhere in the world. But over the years, predation and habitat loss have seen seabird numbers plummet. Today, seabird strongholds are confined to predator-free islands, small islets and isolated stacks. It is only recently that islands and headlands around the Hauraki Gulf have been

cleared of cats, rats and other predators – first Cuvier and Little Barrier in the 1960s and 1970s and most recently Rangitoto and Motunui – and bird populations are returning, notably small petrels and shearwaters, diving petrels and storm petrels. The islands and productive waters of the Hauraki Gulf have since become even more important globally as a seabird habitat.

Finding food and raising chicks

Finding food at sea, as any fisher knows, can be challenging, with prey often patchily distributed. But the Gulf is incredibly productive. In spring, blooms of phytoplankton and zooplankton attract conspicuous numbers of fish, whales, dolphins and seabirds.

Seabirds forage throughout the Gulf, adapting to the changing conditions with a range of strategies to locate and catch prey: some plunge, dive or pursue their prey underwater; others feed from the surface. A number of species feed on plankton and small fish in association with schools of kahawai, kingfish and trevally. Petrels mainly feed at night on squid.

Some seabirds rarely feed in the Gulf itself. Cook’s petrels from Little Barrier Island often forage off East and North Capes, and far out into the Tasman Sea. Grey-faced petrels, winter breeders on northern islands, fly across the Tasman to the east coast of Australia or northwards towards the Pacific Islands and bring back food for their chicks.

Seabirds breed in a variety of habitats and at different times of the year, completing their breeding cycles over several months. They return to colonies in the Gulf to excavate their burrows, usually the same one used the year before, or claim prize spots

within colony sites. Some follow their courtship and mating with a mass pre-laying exodus during which the female birds feed to develop their eggs. They return to their colony to lay. This is followed by a period of incubation and then chick-rearing periods of up to six months. Most seabirds live for 20 to 60 years and some may not return to breed until they are 6-7 years old. Breeding pairs form bonds lasting many years.

Protection of seabirds

All New Zealand seabirds are protected under the Wildlife Act 1953. Those nesting on offshore islands administered by Department of Conservation have further legal protection under the Reserves Act 1977.

“South of Grasper Rock we start to see small diving petrels. Initially birds flying past, that straight-line, frenetic, buzzy-bee flight so typical of this group. Some bounce across the waves, skipping stones, then diving or plunging with a sudden ‘plop’ and disappearing. Others are erupting from the water as we see more and more... Many are visible swimming (flying) through the clear water just under the surface, or located by bubble trails before their heads appear when they came up for air or take flight, an extraordinary sight at such close range.”

1 Chris Gaskin nature diary.



Just how important is the Hauraki Gulf for seabirds?

- The world’s entire population of Buller’s shearwaters breeds on the Poor Knights Islands.
- The world’s entire population of black petrels breeds on Great and Little Barrier Islands.
- The world’s entire population of Pycroft’s petrels breeds on Hen and Chickens Islands, Poor Knights and the Mercury Islands.
- 98 per cent of Cook’s petrels breed on Little Barrier Island.
- Over 20 species of seabirds breed in the wider Hauraki Gulf, including species endemic to northern New Zealand.
- About a third of the world’s 350 seabird species have been seen in northern New Zealand waters.



Photo © Neil Fitzgerald

Flying in from the dead, the rediscovery of an ‘extinct’ bird, the New Zealand storm petrel, in 2003 and numerous subsequent sightings of these enigmatic little seabirds over consecutive summers in Hauraki Gulf waters has led to speculation that it breeds in the vicinity. The eradication of pests from these islands has been crucial to the return of this species.

Finding food

Finding food at sea, as any fisher knows, is seldom easy. Prey can be patchily distributed and seabirds adopt a range of strategies to locate and catch prey.

- Pattering – storm petrels, prions
- Plunging – gannets, terns
- Pursuit plunging – shearwaters, petrels, diving petrels, blue penguins, gannets

- Surface seizing – petrel species, shearwaters, prions, gulls, terns
- Dipping – terns, gulls
- Scavenging – albatross species, petrel and shearwater species, gulls
- Piracy – skuas, gulls, flesh-footed shearwater

Some seabirds also feed in association with schools of fish, like kahawai, kingfish and trevally. Petrel species are predominantly nocturnal feeders feeding mainly on squid.



Photo © Jon Irvine

Terns, gulls, shags and gannets feed at sea but also ashore to roost and nest on rocks, grassy slopes, trees and on sand and shell islands. This photo shows gannets at the Mokohinau Islands.

Global hotspot for seabirds

The Gulf is home to gulls, terns, gannets, penguins and shags, and also attracts the less familiar shearwaters, petrels, prions, storm petrels and albatrosses. The flight, diving ability and body shape of seabirds enable them to live at sea, catching and feeding on marine animals, and dealing with salt ingested from the environment. Fast-flying albatrosses, petrels and shearwaters can forage for food over hundreds, and sometimes thousands, of kilometres offshore, coming ashore only to breed. When their

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CREDITS

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Text: Chris Gaskin
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Related websites: www.haurakigulf.co.nz; www.haurakigulfforum.org.nz; www.haurakigulfmarinepark.co.nz

References:
• Seabird total lengths and weights are from *The Field Guide to Birds of New Zealand*, Bruce Beal & Hugh Robertson, Penguin Books, Auckland, 2000.
• Common, scientific and Māori names from *Checklist of the Birds of New Zealand*, Te Papa Press in association with the Ornithological Society of New Zealand (OSNZ), Wellington, 2010.

Inquiry cycle



1. Dive in

- What do we know already?
 - Introducing knowledge
- Reflecting and evaluating*



2. Ask

- Record ideas
 - What will we investigate?
 - Decide on a 'rich' question
- Reflecting and evaluating*



3. Investigate

- Find out more information
 - Research and collect data
 - Organise information
- Reflecting and evaluating*

9. Review and reflect

- How did it go?
- What are the next steps?

8. Implementing action



4. Thinking

- What does the information tell us?
 - Explore values/perspectives
 - Thinking about patterns/trends
 - Do we need more information?
- Reflecting and evaluating*



7. Planning for Action

- What action will we take?
 - What issue will this address?
- Reflecting and evaluating*

6. Sharing our findings

- Who is our audience?
 - Obtain feedback from our audience
- Reflecting and evaluating*



5. Coming to conclusions

- What did we find out?
 - Creating new ideas
 - Problem solving
- Reflecting and evaluating*

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Adaptations of tāiko

Match the adaptation pictures to the text which describes them.

Short legs and webbed feet

Tāiko legs are like oars and their feet act like paddles to move them quickly and easily through the water.

Tube nose

Petrels have a special tube nose which separates the salt out of salt water so they can drink it.

Powerful hooked beak

For catching prey.

Good sense of smell and sight

To catch prey, find their burrows and sense danger.

Dark coloured body

To provide camouflage.

Light but strong bones

Bones are light (for easier flying) but also very strong (for diving deep under water).

Feather coating

The birds preen their feathers with a waxy oil to protect their feather layers and help repel water.

Navigation

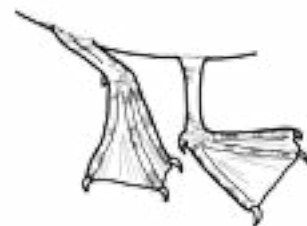
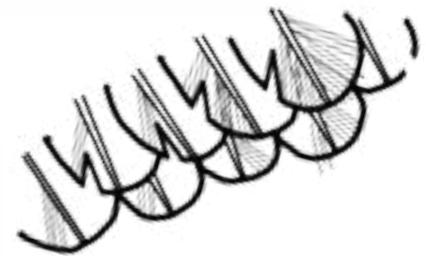
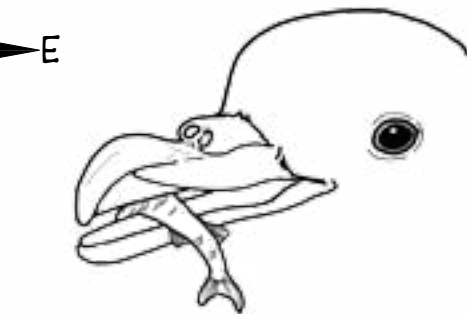
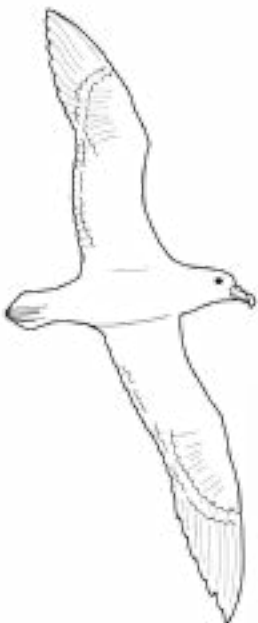
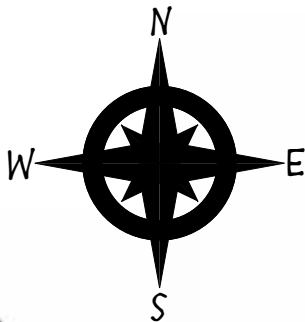
'Internal compass' to be able to sense direction and navigate (find their way).

Large wings compared to their bodies

To help them fly long distances.

Multi-layered feathers

To keep warm and help repel water.



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WONDERS OF THE GULF: SEABIRDS RETURN

As night falls, the nature reserve island of Te Hauturu-o-Toi (Little Barrier) is transformed. Thousands of Cook's petrels home in on the outer Hauraki Gulf to gather close to the island. With dusk they move inland, their calls echoing across valleys and ravines giving scale to the darkened landscape. On still summer nights their wing beats are heard as a delicate hum. They enter the canopy, a sudden crash through branches and leaves, landing with a disarming thud. On the ground the birds shuffle across the forest floor, scrambling over obstacles, finding their burrows with remarkable certainty.



Hauraki Park
Ko te Pātaka kai
o Te Kōpae Moana
Te Moananui a Tāi

Imposing and important: Te Hauturu-o-Toi (Little Barrier Island) holds centre place in the Hauraki Gulf. It is a place of iconic importance for Ngāi Manuhiri and those other hui who also share ancestral ties to it. The island is one of New Zealand's premier nature reserves. Its rugged profile is dramatic from all angles. Ridges and deep, sheer-sided valleys radiate from the central cluster of high peaks. Forest clings to the slopes, except on the cliff faces or where landslips scar valley walls. Regenerating kauri contrasts with mature forest of kauri, hard beech and sub-tropical broadleaf trees.

Hidden treasures: A daytime chorus of tui, kaka, bellbirds, hīhi (titbirds), kokako, kakariki, whiteheads and saddlebacks (tīeke) has been replaced by the calls and activity of nocturnal forest dwellers, both landbirds and seabirds. Seabirds, as their name suggests, spend most of their lives at sea and come ashore only to breed. Being nocturnal over land and nesting in burrows, they are not as obvious as the island's other inhabitants, but are as at home in the night time forest as morepork, kaka, kiwi and kokopu.

Coming back: Grey-faced petrels (ō) have been discovered breeding. Fluttering shearwaters (pōhaka) and common diving petrels (kaaka) (detected using remote sound recorders) appear to be recolonising the island. The New Zealand storm petrel was discovered breeding in one of the island's deep valleys in 2013. How these seemingly fragile little birds escaped the predators of cats and rats remains a mystery.

Eradication legacy: Around a million Cook's petrels breed on Hauturu, that's around 98% of the global population and the island's most abundant bird species by far. It is also one of two places in the world where black petrels breed, with an estimated 100 breeding pairs. Since cats were finally eradicated in 1980 and Pacific rats (kōroa) in 2004, these ground-nesting seabirds are increasing in numbers.

Black petrel, tāiko: These medium-sized petrels (700 grams, 48 cm) also find their food in pelagic waters, especially along the edges of the continental shelf along the north-eastern North Island coast. They are in their colonies from October to July, and like all petrels they raise one chick (up to 123 days). Their largest breeding location is Aotea (Great Barrier Island). However, predation by cats, rats and pigs remain major threats there. Black petrels have been caught by commercial and recreational fishers both in New Zealand and overseas, and are recognised as the most at-risk seabird in New Zealand from commercial fishing.

Cook's petrel, tīke: These beautiful small petrels (180 grams, 28 cm) are summer breeders. They find their food in pelagic waters well offshore: off the east coast of the North Island, northeast of North Cape and in the Tasman Sea. A single chick is raised in a deep burrow over three months with both parents sharing feeding duties. Foraging trips take around six days. During their non-breeding period they migrate to the North Pacific. When the chicks first return to the colony is unknown, but could be after around three years. Cook's petrels used to breed throughout both the North and South Islands, on mountain tops and ranges but after hundreds of years of predation by introduced mammals, they are now confined to just three islands: Te Hauturu-o-Toi and Aotea (Great Barrier Island) in the north and Whenua Hou (Codfish Island) in the far south.

Repeating success: The Department of Conservation's programme of eradicating pests and predators from our offshore islands has been a resounding success. Techniques (and expertise) developed over many years in this country are used increasingly overseas. Around the marine park, the Mokoia's Burgess Island is being recolonised from surrounding islets. Rakitu (Ariel Island) is the 'root cob on the rock', an island with huge potential for seabirds. Great Mercury Island is another. What if Aotea (Great Barrier Island) was free of introduced pests and predators? The ecological benefits to treasured native fauna and flora would be massive.

New Zealand storm petrel: When it was sensationally rediscovered – more than 100 years after its last sighting – this tiny seabird (35 grams, 18 cm) had beaten all the odds and avoided extinction. A handful of nests have been found, shallow burrows or crevices in very steep, rubbly ground in kauri and hard beech forest. Being small birds they have the ability to fly within the forest, reminiscent of the bats they share the forest with. Researchers are working to find out more about the biology of these very special birds.

Burrow-nesting: Most petrels, like this black petrel chick, shearwaters, diving petrels and storm petrels nest in burrows. As a general rule, burrow size varies with bird size. The nest chamber which is usually dry is lined with leaves, moss and twigs carried in from the outside.

Chevron skink, mō kaitiāka: The chevron skink is one of New Zealand's largest and rarest skinks. Recent sightings on Te Hauturu-o-Toi indicate they are benefiting from the removal mammalian predators.

Natural top-dressers: Seabirds link land and sea, shaping the ecology of terrestrial communities. They exploit vast areas of ocean, yet their breeding is concentrated in the same places year after year. Tilling the soils for burrows, leaving guano, dead eggs, chicks, adults, they bring marine-derived nutrients to the forest in a cycle both ancient and vital.

Be vigilant: Entry to Little Barrier Island is by permit only. Prevent stowaways and the transfer of predators and pests to our Hauraki Gulf islands. See www.resourcelands.govt.nz. The Hauraki Little Barrier Island Supporters' Trust raises about \$40,000 each year to support conservation action on the island and runs working weekends for members to the island. See www.littlebarrierisland.org.nz

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SOAR

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The New Zealand Herald

Project director: Tim Higham, Manager, Hauraki Gulf Forum | Art: Dave Goskin | Text: Chris Goskin | Graphic design: Ashleigh Higgins | Further information: see *Seabirds of the Hauraki Gulf. Natural History, Research and Conservation* at www.haurakigulfforum.org.nz

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BLACK PETREL / TĀIKO EDUCATIONAL RESOURCE

Wonders of the Gulf: Seabirds return



Department of Conservation
Te Papa Atawhai

Lifecycle descriptions

Cut out the descriptions of stages in the black petrel's life cycle and place them in the correct order around the life cycle diagram on the handout: Life cycle of the black petrel. The first one is done for you. (Hint: Place cards in order before sticking)

Arriving back to the Hauraki Gulf

I finally arrive back for a kiwi summer in late October and search for a mate.



February to April

My chick is getting bigger and needs plenty of food. The weather is warm.



Flying back to New Zealand

It's September - October; time to make the long flight back to New Zealand.



Time in South America

It's really nice to spend some time in South America and escape the New Zealand winter.



The chick hatches

It's late January- early February and my new baby has hatched - isn't she beautiful?



Chick ready to fledge

I'm so proud that my chick has grown up and is ready to leave the nest. It's late autumn - time for me to get ready to go!



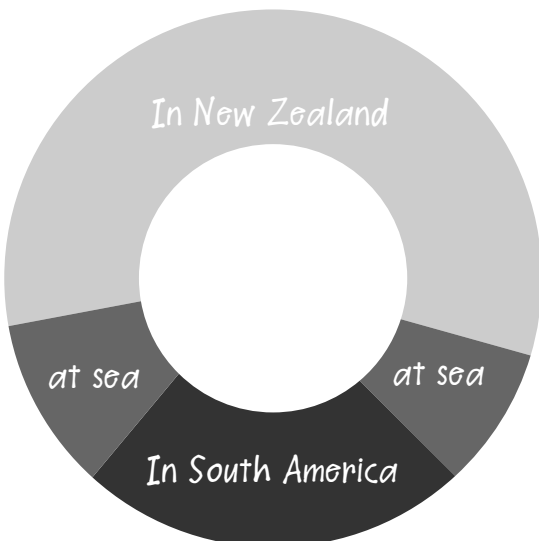
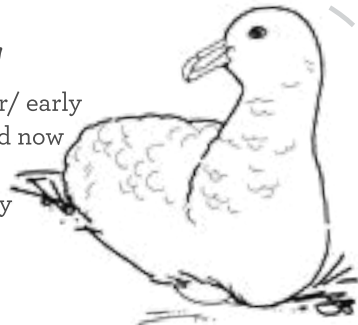
Incubating the egg

I like to keep my egg warm and cosy in our burrow, in between foraging for food. It is December-early January.



Breeding

It's November/ early December and now my burrow is ready. I will lay only one egg.



Place the circle opposite inside the lifecycle diagram to show where black petrels are usually found at different times of the year.

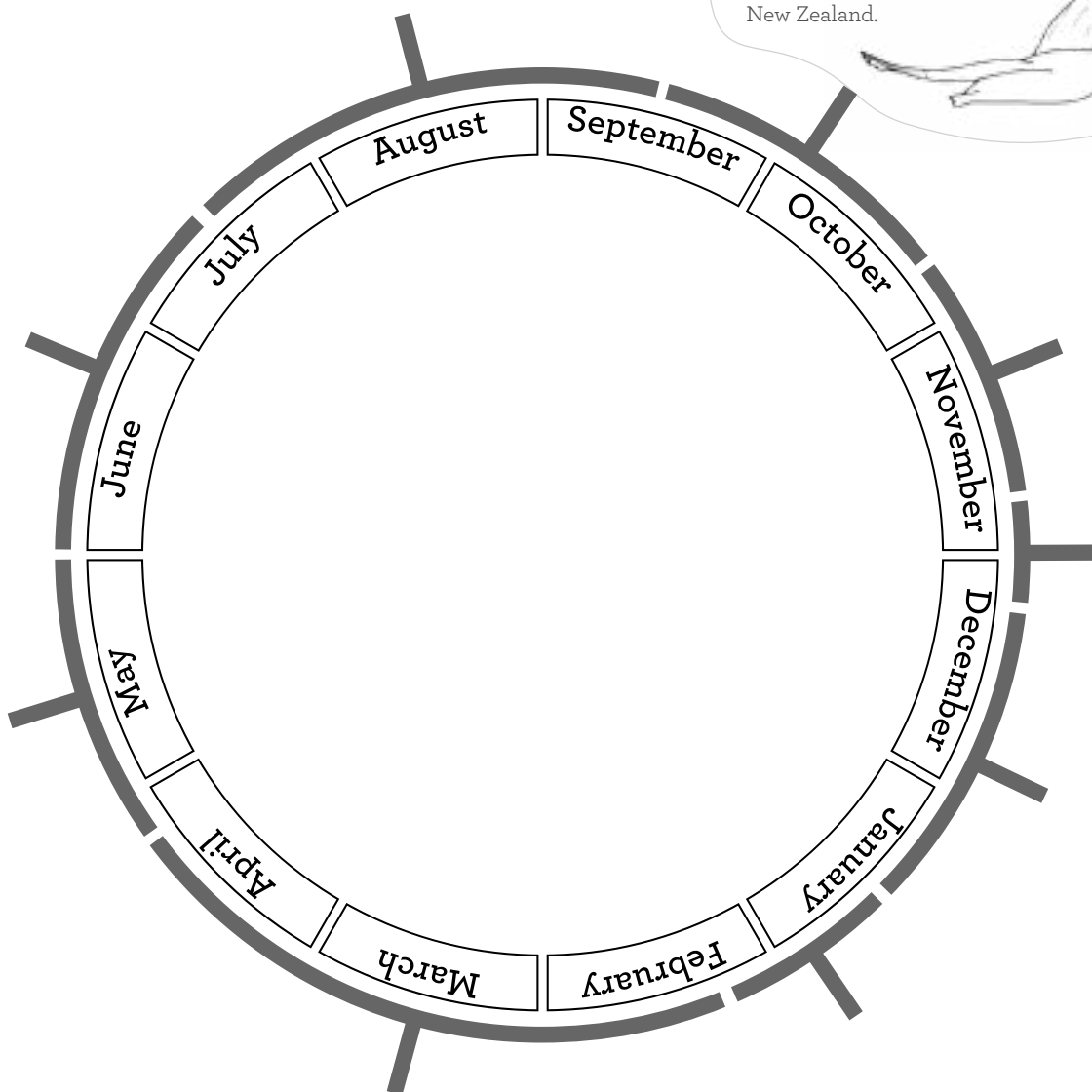
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Lifecycle of the Taiko

Flying back to New Zealand

It's September - October; time to make the long flight back to New Zealand.

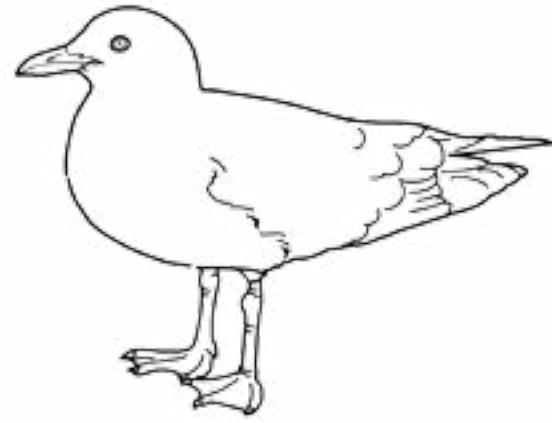


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Red-billed gull facts



Special features

- Adult red-billed gulls have orange-red legs and feet. They get their name from their red bills
- In most places in New Zealand, the numbers of red-billed gulls are decreasing.

Threats

Feeding



Red-billed gulls are vulnerable

Notes and key points

Lifecycle

Habitat

Select 'current page' in the print dialogue box

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Little blue penguin / kororā facts facts

Interesting facts

- Little blue penguins are the smallest penguins in the world.
- Penguins are flightless birds but they are excellent swimmers and divers .
- All penguins moult (they lose all their feathers) once a year.



Threats

Feeding

Notes and key points

Lifecycle

Habitat

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Little blue penguins are not threatened

Gannet/tākapu facts

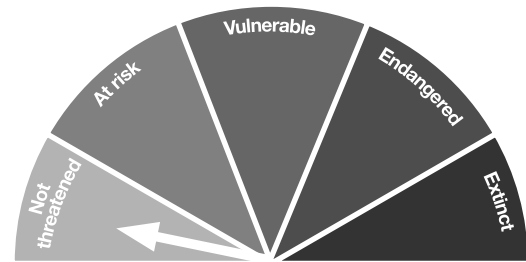
Interesting facts

- Adult gannets have a white body with yellow colouring on their heads.
- Gannets can reach up to 145km per hour when diving for prey.
- They have special air sacs inside their necks to cushion their impact when they dive into the water.



Threats

Feeding



Gannets are not threatened

Notes and key points

Lifecycle

Habitat

Select 'current page' in the print dialogue box

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Black petrel/tāiko facts



Interesting facts

- The black petrel has been recognised as the most at-risk seabird from commercial fishing.
- Sometimes black petrels feed alongside dolphins or whales.
- They are usually quiet at sea and only make noises when they come back to their burrows at night.

Threats

Black petrels are threatened by fishing, introduced predators, and habitat destruction.

Feeding

Black petrels eat mostly squid, and also fish and crustaceans. They often feed at night (when squid are bioluminescent) and will fly over long distances to feed.



Black petrels are vulnerable

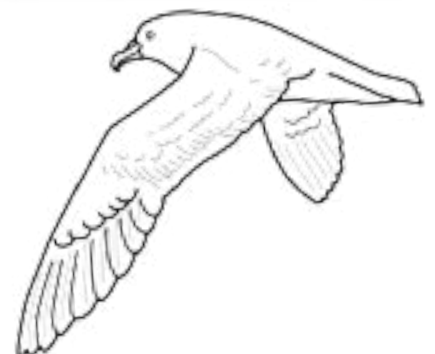
Notes and key points

Lifecycle

Habitat

During the breeding season pairs of black petrels live in forest/mountain areas on Great Barrier Island/ Aotea and Little Barrier Island/ Hauturu. They live in forest burrows in the ground with their chicks.

In winter, black petrels migrate to South America, mainly off the coast of Peru and Ecuador. While migrating they live at sea.



Groups of people and seabirds



We depend on catching fish to make a living. Sometimes seabirds can get in the way. We do what we can to avoid them.

Fishers

We provide fresh fish for people to eat. We go out in our boats and work hard to catch as many fish as we can. Fishing provides work for many people in our community.

There are special methods we can use to stop birds getting in the way of the fishing lines. We use heavy weights to make lines sink fast and we hang moving objects around the lines to scare birds away.



Local Iwi – Tangata Whenua

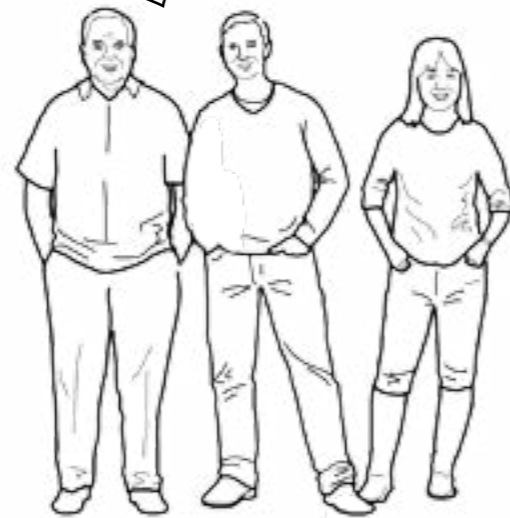
We have been involved with seabirds and other animals here over hundreds of years. We remember a time when the coast of Aotearoa was alive with birds.

We work to protect the air, water, land, native animals and the health of our people. Our belief is that we must look to the past to help make good decisions for future generations.

As kaitiaki of the land and the sea, our role is to protect the mauri of these places and keep our connections with them strong.



We need more protection for seabirds in areas where they breed and at sea.



Students at a local school

The sea is an important part of our lives. We swim and play on the local beaches. Seabirds live in this area and we often see them when we are on the coast. When we are out fishing the seabirds sometimes try to catch our bait.

We have been studying seabirds and we learned during our inquiry that some pets like cats and dogs can harm seabirds.

We are concerned that if something is not done, we may lose some of our seabird species forever.



Scientists

We are researching many species of seabirds around New Zealand. We observe the birds and record their behaviour. We also check some populations to see how many birds survive each year. Our research shows that many seabird species are at risk of becoming endangered in the future. Climate change, fishing and introduced predators all have an impact on these birds.



Local council

All groups of people in the community have a role to play to look after our seabirds. We work with different groups to help restore seabird habitat.

Our community has its own issues with different groups of people involved. We need to respect the part that each group plays in the community and try to work together.

We have systems in place which help to allow the community to have what it needs without seriously affecting the health of our coasts and seabirds.



Environmental group

The environment is important to us and our role is to protect our native plants and animals. We give our time and work hard to replant and protect coastal areas for local people to enjoy.

We believe that people should not let their pets loose when seabirds are breeding. The community needs to know more about seabirds and what they can do to help them.

Student inquiry notes

1. Dive in

What do you already know about these birds?

2. Ask

What do you want to know?

Focus seabird!

3 & 4. Investigate and thinking

What will you investigate?

8. Taking action

7. Planning for action

What action will you take and why?

5. Conclusions:

What have you learnt? What conclusions have you come to?

6. Sharing your findings:

How will you share and present your findings?

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Brief

Focus seabird

The BEST future we can imagine — what is it like for this seabird?

Focus issue — Which issue are we targeting?

Our action will be:

How will this action help solve the focus issue?

Criteria

What things MUST the action achieve?

-
-

What will it include?

-
-
-

The action will look like:

How will this action restore mauri to the area?

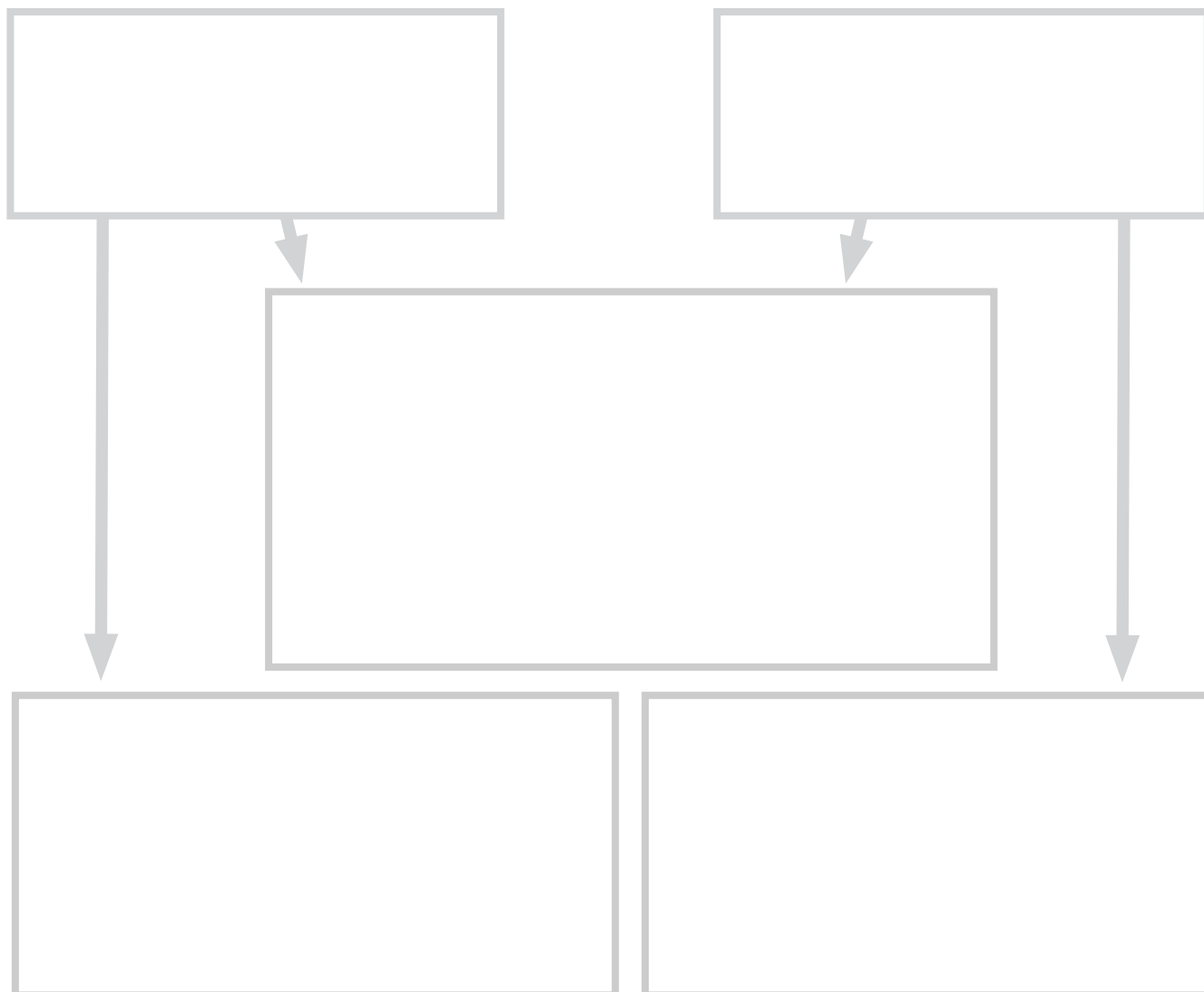
What difference will this make for the future of your focus seabird?

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Seabirds: What is the same? What is different?



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[Return](#)

Thinking: Are these seabirds similar or very different? Why?

Other questions

Action plan

Use this template to help you to plan for action for seabirds

The BEST future we can imagine – what is it like for this seabird?

What are we going to do?

Action:

Steps:

- 1
- 2
- 3
- 4

What?

What we need

Cost

Total

When

When will we start?

When will each step happen?

- 1
- 2
- 3
- 4

When will we finish?

How

How will we get the resources we need?

How will we inform people about our action?

Who

Who do we need to talk to about this?

Will we need permission?

Who can we involve?

Will we need any experts? Who could we ask for help or donations?

Select 'current page' in the print dialogue box

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Reading and integration links

Section 1: The tāiko/ black petrel and other seabirds

Activity 1: Introducing the taiko and other seabirds

Inquiry stage 1: Dive in

Integration opportunities

Literacy links Speaking: Sharing ideas through conversation Writing: Expressing ideas	Reading: Related journal articles	Trouble at sea: Forest and Bird magazine: November 2014
		Lunch with a southern giant petrel: SJ pt1, no 2, 2010
		Voyage of Exploration: CN No. L4 2012
Mathematics links	Number and algebra	www.nzmaths.co.nz/resource/fifty-five-feathers
IT links	More information about black petrels	www.nzbirdsonline.org.nz/species/black-petrel
		www.nzbirds.com/birds/blackpetrel.html
		www.tiritirimatangi.org.nz/blackpetrel
		www.doc.govt.nz/conservation/native-animals/birds/birds-a-z/sea-and-shore-birds/
	Apps	WhatBird NZ (Hotcafe Ltd) NZ Fauna (Kiwipedia)

Activity 2: Special features and adaptations

Inquiry stage 2: Ask

Integration opportunities

Literacy links	Reading: Related journal articles	Feathery friends -CN No. 1 2001 Pgs 2-7
		Who's eating who - CN No. 4 2012 pgs 14-21
		A bird in the hand CN No 3 2007 pgs 20-27

Mathematics links	Navigation and geometry activity	arb.nzcer.org.nz/resources/maths/geometry/4000/gm4133.htm
IT links	Adaptation information	sciencelearn.org.nz/Science-Stories/Conserving-Native-Birds/Native-bird-adaptations
	Flight: Science learning hub	sciencelearn.org.nz/Contexts/Flight/NZ-Research/Flight
	Adaptations for flight interactive	sciencelearn.org.nz/Contexts/Flight/Sci-Media/Animations-and-Interactives/Wings-for-flight

Activity 3: Lifecycle and habitat

Inquiry stage 3: Investigate

Integration opportunities

Literacy links	Reading: Related journal articles	Kuaka: The marathon bird: L3, Sept 2011
		Dotterel chicks: Pt 02 No. 2 1998
		Welcome home: Pt 01 No. 2 2010
		A source of life: CN No. L4 2012
Mathematics links	Geometry	Figure it out: Technology in Practice 3+4+, Penguin Properties www.nzmaths.co.nz/resource/penguin-properties
IT links	More information on habitat and life cycles	www.nzbirdsonline.org.nz
		www.teara.govt.nz/en/land-birds-overview/page-5
	Habitat games	www.habitatthegame.com
		www.switchzoo.com/games/habitatgame.htm
	Apps	NZ Fauna (Kiwipedia)

Activity 4: Finding out about seabirds

Inquiry stage 4: Thinking

Integration opportunities

Literacy links	Reading: Related journal articles	The plight of the penguins: Pt 03 No. 03 2005
		Meeting a penguin: Pt 02 No. 3 1989
		Sewing seagulls: Pt 01 No. 01 2005
		Can it be a gannet? Pt 02 No. 3 1998
		Takapu: Junior Journal No. 45 2012
		What is a penguin (sunshine books)
IT links	There are relevant pages on all the species at these two sites	www.nzbirdsonline.org.nz
		www.teara.govt.nz
	Other links to general seabird information	www.doc.govt.nz/documents/conservation/marine-and-coastal/fishing/fishers-guide-nz-seabirds.pdf
		www.southernseabirds.org/fileadmin/documents/Other/SSS_FACTSHEETS_2.pdf
		www.doc.govt.nz/getting-involved/conservation-activities/meet-the-locals-videos/sixth-series/little-blue-penguins
		www.doc.govt.nz/getting-involved/conservation-activities/meet-the-locals-videos/fifth-series/gannets-galore
www.bluepenguin.org.nz		

Reading and integration links

Section 2: People and seabirds

Activity 5: People and seabirds

Inquiry stage 4: Thinking

Integration opportunities

Literacy links Speaking: Sharing ideas through conversation Writing: Expressing ideas and perspectives	Reading: Related journal articles	People and Seabirds
		The bittern: Pt 03 No. 01 2009
		Picking up rubbish: Pt 01 No. 1 1996
Mathematics	Statistics: Data, tables	http://nrich.maths.org/7553
IT links	Māori perspectives	www.teara.govt.nz/en/papatuanuku-the-land
	Southern Seabird Solutions	southernseabirds.org/about-us/
	Pro Delphinus organisation, Peru	youtube.com/watch?v=hfcOr_1_LSg
	Fisheries role play	sciencelearn.org.nz/Contexts/Life-in-the-Sea/Teaching-and-Learning-Approaches/Fisheries-role-play

Activity 6: Threats to seabirds

Inquiry stage 4: Thinking

Integration opportunities

Literacy links Writing : arguments	Reading: Related journal articles	59.5C South: L3 No. August 2013 p.10
		Puketi robins: Part 2 No 1, 2011
		Flight of the Albatross -Pt 03 No. 02 2009
		The Great Barrier Reef: see it while you can. L4 No. May 2013
		Giving the ocean a voice: CN No. 02 2013
		“What a Disaster!”- SJ L2 Aug 2012
		Taking the bait: CN L4 2012 p24
		Keep your cat inside: CN No. 4, 2013
Mathematics	Numbers and algebra, Geometry and measurement	It seemed like a good idea at the time: Connected L3, 2011: Border Security
		Bat maths: Connected 1, 2002
	Statistics	Figure it out L3-4 Fish figures
IT links	Forest and bird video - Recreational fishing	youtube.com/watch?v=p11_KDLnF-s
	Google slides version of ‘Giving the ocean a voice’:	docs.google.com/presentation/d/1_lgCYBARzMfibvcSuXmOgLluWXUpRHqkNZPn3nHKE6M/present?slide=id.p
	NIWA video about climate change:	niwa.co.nz/videos/our-world-is-changing
	Teaching notes: An ecologist on ice:	An Ecologist on Ice: CN L4, 2013
	Mindmap tools:	popplet.com
		coggle.it

Activity 7: Visiting seabirds in the local environment

Inquiry stage 3, 4 and 5: Investigate, Thinking and Coming to conclusions

Integration opportunities

Literacy links Writing: expressing information and ideas	Reading: Related journal articles	Visit to Muriwai (gannet colony): JJ 45
		Gather your data: CN No. 04 2013
		Flight of the Albatross -Pt 03 No. 02 2009
		Take a closer look: CN L2, 2013
		An ecologist on ice: CN: L4, 2013
		What's that? CN No1, 2009
		Taking the bait: CN L4 2012 p24
		Keep your cat inside: CN No. 4, 2013
Mathematics	Algebra	www.nzmaths.co.nz/resource/helping-hand
IT links	EOTC	www.eotc.tki.org.nz
	Virtual trip to Great Barrier Island	https://youtu.be/AkbyA2EM7b4
	Apps	iNaturalist, by iNaturalist ICC (Apple, Android)
NatureWatch NZ by NatureWatch		

Reading and integration links

Section 3: Helping seabirds

Activity 8: Protection of seabirds

Inquiry stages 5 and 6 – Coming to conclusions and sharing our findings

Integration opportunities

Reading resources	Background information	An article that discusses plastics in the ocean and their effects on seabirds: http://conservationmagazine.org/2014/02/plastic-ingestion-seabirds-worse-thought/
		Seabird safe guidelines: southernseabirds.org/resources/mitigation-tools-practices/
	Learning experience	www.youtube.com/watch?v=zg3i2Nsyrag
		www.doc.govt.nz/getting-involved/conservation-activities/meet-the-locals-videos/sixth-series/taiaroa-head-seabirds/
		www.yellow-eyedpenguin.org.nz/
		www.huttonsshearwater.org.nz/
		www.facebook.com/chathamtaikotruster
	Other examples of sanctuaries	Cape Sanctuary- Hawkes Bay- includes seabirds such as gannets: www.tvnz.co.nz/meet-the-locals/s2009-e12-capesanctuary-video-2806699 www.poutiri.co.nz/partners/te-matau-a-maui-cape-kidnappers-sanctuary/
		Stewart Island community helping penguins -trapping rats and possums- protecting birds: www.tvnz.co.nz/meet-the-locals/2008-episode-113-video-2262405 www.sircet.org.nz/Our_work.php

Literacy links Speaking and presenting: Sharing ideas through presentation	Reading: Related journal articles	An island in time: SJSL Years 5-6, 04, 2011
		Puketi robins: Pt 2 No 1, 2011
		An ecologist on ice: CN No. 04 2013, p10
		Flight of the albatross: Pt 03 No. 02 2009
		Tiakina a Tangaroa – Protect our seas L2 No. Oct 2011 p2
		Wrybills at Risk: Pt1 no 4, 2008
		Kaitiaki of the stream: Level 2, October 2013
		Can it be a gannet? Pt 2, No. 3, 1998
Mathematics	Geometry	Figure it out: Technology in Practice 3+4+ www.nzmaths.co.nz/resource/penguin-properties
IT links	Future problem solving	nzcurriculum.tki.org.nz/Principles/Future-focus
		nzcurriculum.tki.org.nz/Curriculum-stories/Media-gallery/Future-focus/Future-Problem-Solving
	Hauraki Gulf treasure islands	www.treasureislands.co.nz
	Network of conservation groups	www.naturespace.org.nz
	Kaitiakitanga	www.teara.govt.nz/en/kaitiakitanga-guardianship-and-conservation/page-1
	Apps	NZ Fauna (Kiwipedia)
Ansel and Clair: Little green island (Dana Villamagna)- Apple, android		

Activity 9: It's time to act for seabirds

Inquiry stages 7, 8 and 9 – Planning for action, implementing action and review and reflect

Integration opportunities

Reading resources	Background information	Oakura School: nzcurriculum.tki.org.nz/Curriculum-stories/School-snapshots/Oakura-School
	Examples of schools' action projects	Mangawhai School: Helping the fairy tern: tvnz.co.nz/meet-the-locals/s2009-e9-fairyterns-video-2802957 stuff.co.nz/auckland/local-news/rodney-times/2490839/Turning-heads-in-the-US
Learning experience		Decision making tool: efs.tki.org.nz/Curriculum-resources-and-tools/Decision-Making-Grids
		Action issues: www.cleanuptheworld.org/PDF/au/plastic-bags---revised-household-version_final.pdf
		Action issues: http://www.forestandbird.org.nz/climatechange
		Action issues: www.doc.govt.nz/publications/conservation/threats-and-impacts/biosecurity/help-protect-new-zealands-offshore-islands-from-pest-animals-plants-and-insects/

Literacy links Speaking and presenting: Sharing ideas through presentation	Reading: Related journal articles	The plight of the penguins Pt 03 No. 03, 2005
		Dead car clean up Pt 02 No. 2 2004
IT links	Future focus principle	nzcurriculum.tki.org.nz/Principles/Future-focus
	Teacher talks about future problem solving	nzcurriculum.tki.org.nz/Curriculum-stories/Media-gallery/Future-focus/Future-Problem-Solving
	Kaitiakitanga	www.teara.govt.nz/en/kaitiakitanga-guardianship-and-conservation/page-1
	Kaitiakitanga	www.teara.govt.nz/en/kaitiakitanga-guardianship-and-conservation/page-1
	Community restoration information and data	naturespace.org.nz
	Apps	NatureWatch NZ (Apple) eEcosphere @ eecosphere.com