

Auckland Zoo Education Pack

Secondary



Theme:
Adaptations birds

Zoo Lesson plan

Theme: Secondary (ages 11-17) **BIRD ADAPTATIONS**

What will I learn: How birds have adapted to many different habitats and fill different niches.

Inspire

Learn more about birds on our Auckland Zoo website animal pages - [Birds](#)

Learn some **Adaptations Vocabulary** (resource attached).

Learn birds names in Te Reo Maori with our sing-a-long - [Birds of Te Wao Nui sign-a-long](#)

Watch this video to learn where feathers came from - [How did feathers evolve?](#)

Explore

Complete our **Bird Comparison** (resource attached) to see how bird features change, depending on the habitat and niche.

Compare and contrast the adaptations of birds from two different habitats. Try our example for **Forest vs. Aquatic birds** (resource attached).

Compare some human tools to bird beaks with **Brilliant Beaks** (resource attached). Next play our **Bird Beak-a-thon** (resource attached) with your whanau.

- Try again with this variation: remove all but one food source. Which "beak" is most successful? Explain in terms of evolution of the species.

Create

Get colourful and find out more about New Zealand's amazing bird species with these **Manu Cards** (resource attached).

Be a star! Share your fancy footwork, amazing voices and fabulous outfits. Watch how some birds catch the eye of a potential partner and be inspired. How do these displays help the success of the species?

- Fancy footsteps: [Flamingos have sweet dance moves](#) and [birds of paradise](#)
- Sing stars: [Lyre bird copycat](#)
- All dressed up: [Peacocks Shake and Rattle to attract females](#)
- Learn some [flamingo dance moves](#) and share with us.

Reflect

Take a moment to reflect on how different New Zealand would be without birds. What important roles do birds play in our ecosystems?

Reflect on why kiwis are sometimes called an "honorary mammal" and are so different from other birds around the world.

- Find out more - [About kiwi: Kiwis for kiwi](#)
- Watch this video - [Why can't some birds fly?](#)

Act

Helping birds is as simple as planting native plants in your garden, putting a bell on your cat, walking your dog on a leash and building a nectar feeder - [Nectar Feeder](#)

Backyard Science! Head outside for 5 minutes and see what birds are around! Help conservation scientists and complete this survey - [Bird Survey](#)

Curriculum links:

Lessons include a range of aspects from the main strands of the NZ Curriculum English, the arts, health and physical education, learning languages, mathematics and statistics, science, social science and technology.

They also consider the Key Competencies Thinking, Using language, symbols and text, Managing self, Relating to others, Participating and communicating.

►► Adaptations◀◀

Essential words

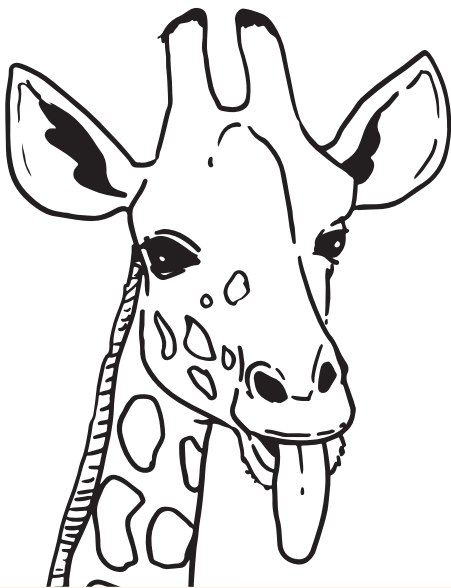
Adaptation A body part, feature or behaviour that helps an animal or plant succeed in its environment

Habitat The place where animals and plants live and connect with each other

Camouflage A way of hiding something by colouring or covering it to look like its surroundings, some living things also change their behaviour too

Carnivore An animal that eats other animals

Herbivore An animal that eats plants



Extras for experts

Predator An animal that catches and eats other animals

Prey An animal that is caught and eaten by another animal

Nocturnal Animals who are most active during the night

Diurnal Animals who are most active during daylight

Omnivore An animal that eats a variety of animals and plants

Observation Learning through careful watching, then recording what we see over time

Scientist A person who asks questions about the world and finds evidence and researches to understand

Behavioural adaptation Actions of an animal that help them to survive in their habitat

Structural adaptation Features on an animal's body that help it to survive in their habitat





Prehensile

Many animals have developed prehensile body parts. What does prehensile mean? How can this adaptation help different animals?



▶▶ Bird comparison

To complete the table, describe or draw the features of these different birds and explain how it helps them survive in their habitat.

You could use <https://www.dkfindout.com/us/animals-and-nature/birds/> and our [animal pages](#) to help.

Birds	Habitat	Diet	Wings	Feathers	Feet	Beak
						
						
						
						

▶▶ Bird comparison

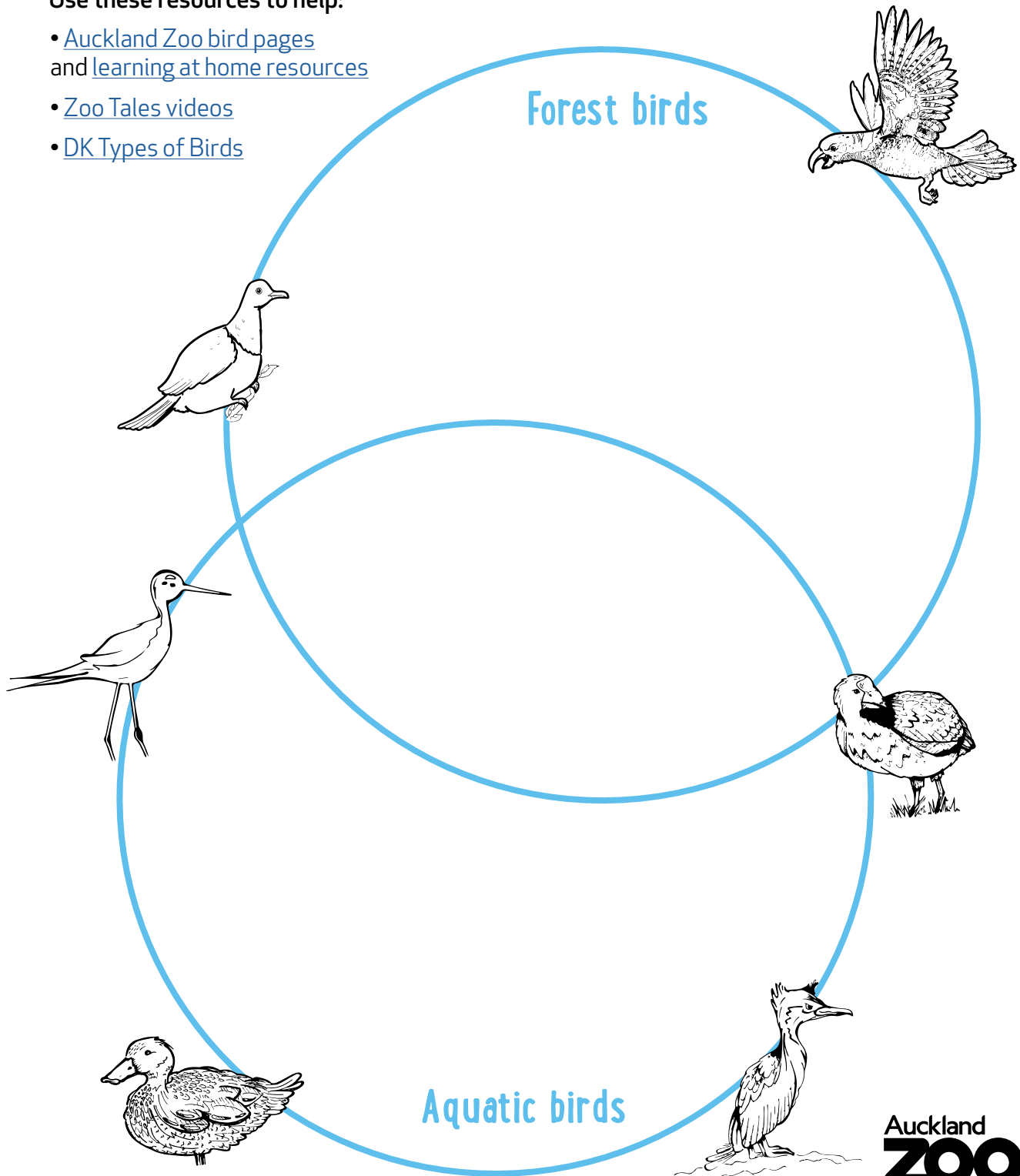
Birds	Habitat	Diet	Wings	Feathers	Feet	Beak
						
						
						
						

Forest vs. Aquatic bird adaptations

Compare and contrast the adaptations of aquatic birds to forest birds using the diagram below. Include body parts and behaviours as well as any other adaptations you can think of...

Use these resources to help:

- [Auckland Zoo bird pages](#) and [learning at home resources](#)
- [Zoo Tales videos](#)
- [DK Types of Birds](#)








▶▶ Brilliant beaks!

Birds have amazing adaptations to help them survive in their habitats including beaks which are adapted to eating their different diets. Some of our tools are very similar!

Your challenge

Match the bird beaks with the human tools using the descriptions as clues.

Bird and Description		Human tool
	Flamingos Eats shrimp using their beak to strain the shrimp from the water.	Nutcracker
	Macaw Eats nuts and seeds, using their strong beak to crack them open.	Tongs
	Kea A sharp, curved beak that can be used for a variety of things including digging and manipulating objects.	Chopsticks
	Kiwi Use their long thin beaks to search for insects and grubs amongst the leaves on the forest floor.	Multi-tool
	Ostrich Flat, broad beak for grasping at the roots, flowers, leaves and other things.	Sieve

Extra for experts

Create your own examples using some other birds with different kinds of beaks. Can you create your own beak challenge?

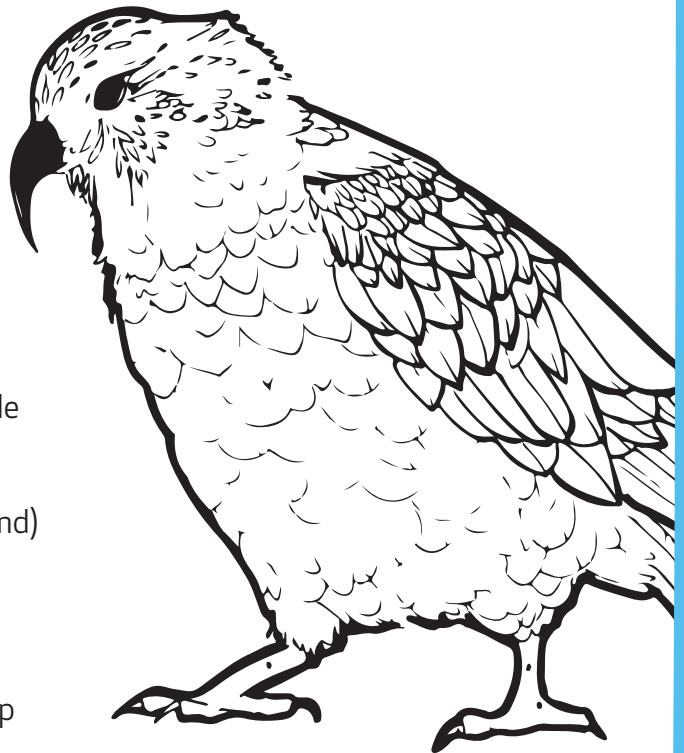
►► Bird beak-a-thon ◀◀

Birds have beaks that match their primary food source!

With a group of people you can test out some different bird **beaks** and see which work best!

You will need

- Some different bird **beaks** (e.g. tongs, tweezers, chopsticks, pegs, a skewer, a straw or anything you have available that resembles a bird beak)
- Some different bird **foods** (e.g. worms made out of cut up rubber bands, mini marshmallows, paperclips, jelly beans, marbles, blocks – whatever you have on hand)



Your challenge

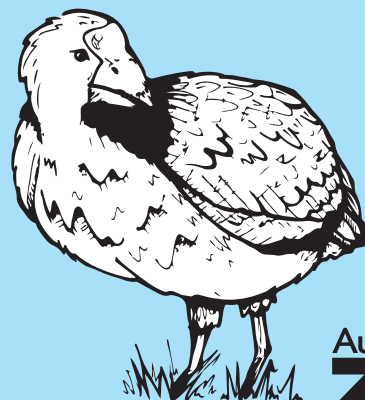
1. Compete with the other birds in your group to get as much food as possible.
2. Spread out your various **food** items, and then choose a **beak** to be your tool.
3. Race to see how much food you can collect using your beak until all the food is gone!
4. Try another round and test out some of the different beak options.

Reflect

Which **beaks** worked best?

Did some **beaks** work better for certain items and not for others?

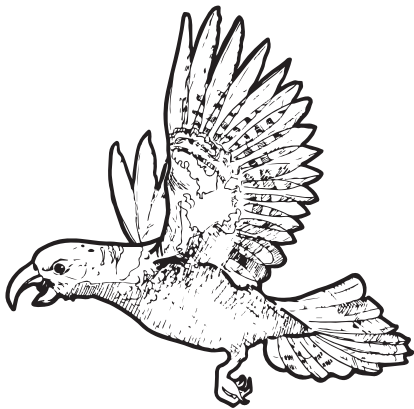
Can you think of any birds that have a beak similar to any of your **beaks**?



▶ Manu cards

Instructions

1. Print and cut out the flash cards below.
2. Glue or simply fold each card so that the image is on the front and the information is on the back.
3. Research each bird online to find out how to accurately colour their feathers.
4. Ask a friend or family member to test your bird knowledge.
5. Use Auckland Zoo's bird song to help remember these cards and the Te Reo Maori names for our native and endemic species.



Kākā

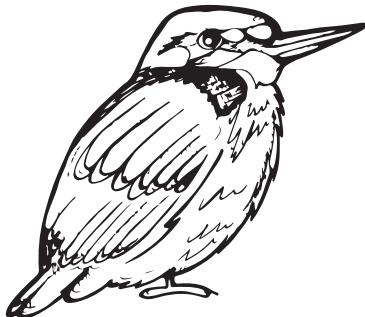
Scientific name: *Nestor meridionalis*

Order: **Psittaciformes**

Status: **Endemic - Recovering (at risk)**

Habitat: **native forest**

When the kākā flies, it reveals a bright red underwing! Kākā are mainly threatened by stoats, but also impacted by habitat loss and other introduced predators (such as possums who prey on nests). Kākā populations are more successful in pest-free areas.



Kōtare

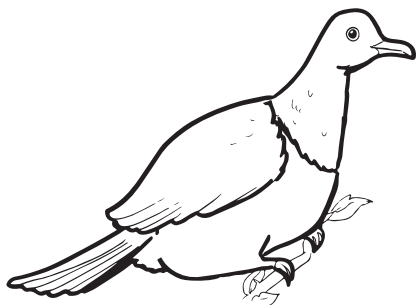
Scientific name: *Todiramphus sanctus*

Order: **Coraciiformes**

Status: **Native - Not Threatened**

Habitat: wide range of habitats near water; including **forest, farmland, rivers, coasts and estuaries**

Kōtare perch above open spaces to watch for prey, especially on powerlines. They can even dive up to 1m in water for food.



Kererū/ Kūkupa (New Zealand pigeon)

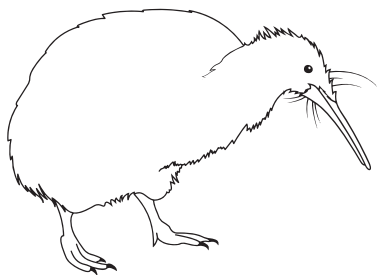
Scientific name: *Hemiphaga novaeseelandiae*

Order: **Columbiformes**

Status: **Endemic – Not Threatened**

Habitat: **native forests, farmland and urban areas**

It is the only bird in the forest large enough to swallow berries from karaka, miro and tawa trees and spread the seeds. This makes the kererū a vital part of the New Zealand forest ecosystem.



Brown kiwi

Scientific name: *Apteryx mantelli*

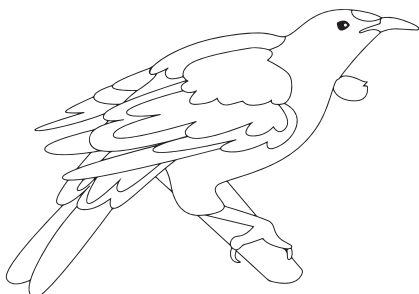
Order: **Struthioniformes**

Status: **Endemic – Declining (at risk)**

Habitat: **native forest, shrubland and farmland**

Kiwis hunt at night using their sense of smell and sensitive bill tip like a probe to detect moving prey.

They cannot fly, making them vulnerable to predatory land mammals. Auckland Zoo is proud to work with DoC's and Kiwis for Kiwi to protect kiwi in many areas of New Zealand.



Tūi

Scientific name: *Prosthemadera novaeseelandiae*

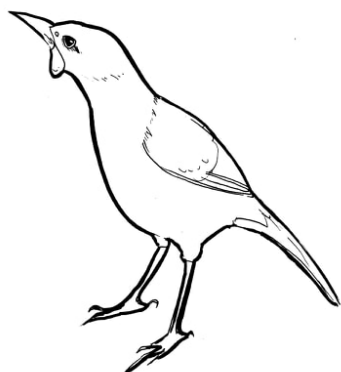
Order: **Passeriformes**

Status: **Endemic – Not Threatened**

Habitat: **forest and suburban gardens**

The tūi's white throat tufts are called poi. They feed on the sweet nectar of many native flowers like kōwhai, pōhutukawa, rātā, flax and pūriri.

Put sugar-water in your garden and see who visits!



Tīeke

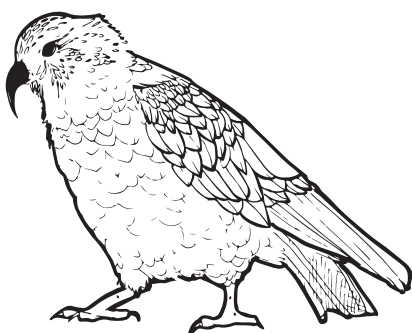
Scientific name: *Philesturnus rufusater*

Order: **Passeriformes**

Status: **Endemic - Recovering (at risk)**

Habitat: **scrub and forest**

Easily identified by their brown saddle marking and red wattle. Tīeke roost in tree holes, making them vulnerable to introduced mammals and can only exist on pest-free islands and sanctuaries. Forty years ago their numbers had dwindled to just 500 - but today, there are more than 7,000 tīeke on predator-free islands and fenced mainland sites.



Kea

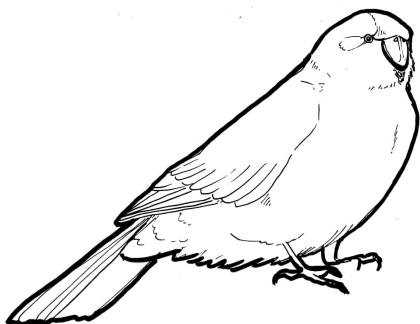
Scientific name: *Nestor notabilis*

Order: **Psittaciformes**

Status: **Endemic - Nationally Endangered**

Habitat: **alpine / South Island mountain ranges**

Kea are the only true alpine parrot and one of the most intelligent birds in the world; naturally curious and attracted to human belongings.



Kākāriki

Scientific name: *Cyanoramphus novaezelandiae*

Order: **Psittaciformes**

Status: **Endemic - Not Threatened**

Habitat: **forest and shrublands**

Kākāriki were once common across New Zealand but were nearly eliminated by introduced pests. They are common on pest-free islands and around Wellington on the mainland.



Ruru (Morepork)

Scientific name: *Ninox novaeseelandiae*

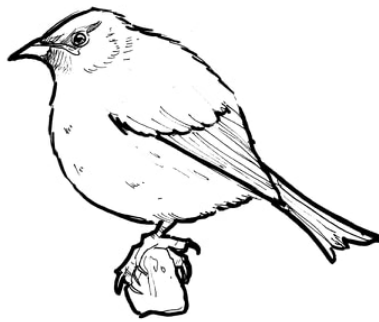
Order: Strigiformes

Status: Native – **Not Threatened**

Habitat: native forest and farmland

The ruru is a nocturnal owl and hunts a range of prey including insects, rodents and small birds.

Both its Māori and common names are onomatopoeia for its "ru-ru" and "more-pork" calls which can be heard through the forest at night.



Korimako (New Zealand bellbird)

Scientific name: *Anthornis melanura*

Order: Passeriformes

Status: Endemic – **Not Threatened**

Habitat: forest, shrubland, urban parks and gardens

The korimako has a brush-like tongue to collect nectar from flowers. They play an important role in pollinating NZ's native plants.

Bellbird chicks cannot access flowers while in their nest, so they are fed bugs - making them omnivores!



Tētē (Grey teal)

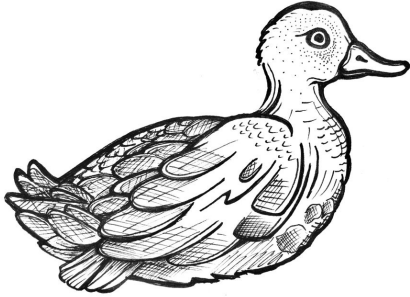
Scientific name: *Anas gracilis*

Order: Anseriformes

Status: Native – **Not Threatened**

Habitat: shallow, freshwater lakes and swamps

Grey teal are one of the most common ducks in Australia. They are self-introduced to New Zealand; flying here after droughts. Stoats are common in wetland areas, posing a threat to adult tētē and their nests.



Pāteke (Brown teal)

Scientific name: *Anas chlorotis*

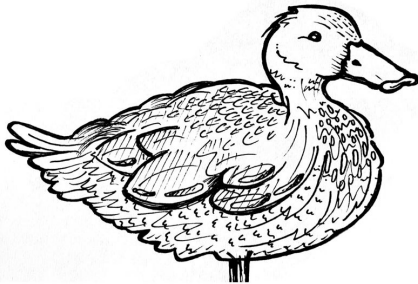
Order: Anseriformes

Status: Endemic – Recovering (at risk)

Habitat: rural ponds and rivers on mainland, estuaries on Great Barrier Island

Pāteke are the rarest waterfowl on mainland New Zealand due to introduced mammalian predators. They are crepuscular; mainly active at dusk and dawn.

Auckland Zoo are helping to boost pāteke population through breeding.



Whio (Blue duck)

Scientific name: *Hymenolaimus malacorhynchos*

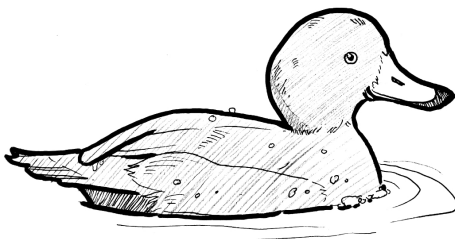
Order: Anseriformes

Status: Endemic – Nationally Vulnerable

Habitat: clean, high altitude, fast-flowing rivers

Whio are key indicators of healthy rivers in New Zealand and are even on the \$10 note!

They are at risk of becoming extinct due to predation, poor water quality and destruction of riverbanks.



Pāpango (New Zealand scaup)

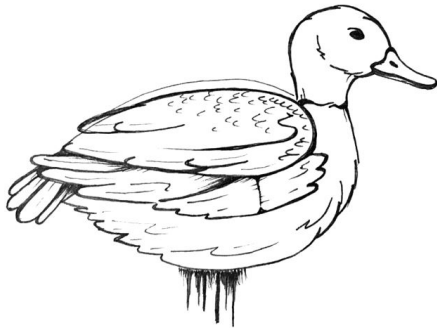
Scientific name: *Aythya novaeseelandiae*

Order: Anseriformes

Status: Endemic – Not Threatened

Habitat: freshwater lakes

Being a specialised diving duck, pāpango spend a long time under water foraging and can dive up to 3m deep, feeding on small fish and invertebrates. Like all diving ducks, its large, webbed feet are further back; allowing them to swim more effectively.



Pūtangitangi (Paradise shelduck)

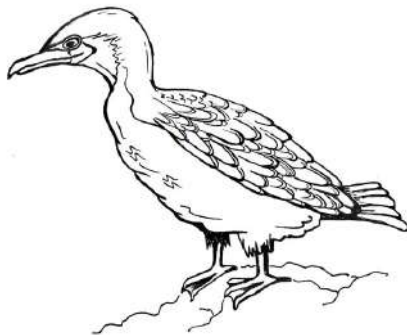
Scientific name: *Tadorna variegata*

Order: **Anseriformes**

Status: **Endemic – Not Threatened**

Habitat: **freshwater lakes and rivers, mountains, farms and urban parks**

The paradise shelduck is the most widespread waterfowl in New Zealand. The female is more eye-catching than the male with their bright white heads.



Kawau (Black shag)

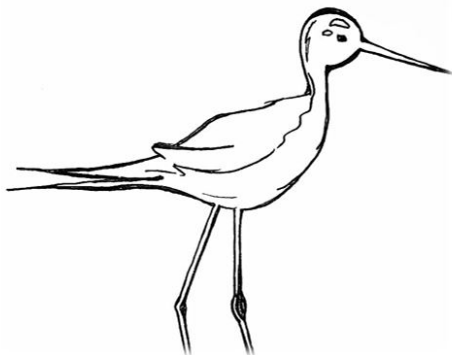
Scientific name: *Phalacrocorax carbo*

Order: **Pelecaniformes**

Status: **Native – Not Threatened**

Habitat: **range of wetlands around the world; both fresh and saltwater**

While there are no residents at Auckland Zoo, wild kawau sometime fly in to visit our lion moat! They have poor eyesight underwater so use a special flushing strategy to disturb prey before catching them.



Poaka (Black-winged/pied stilt)

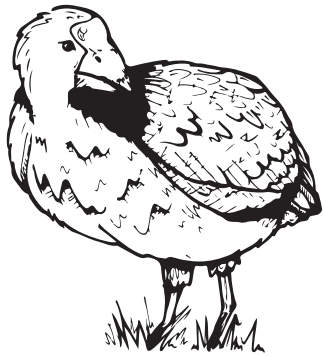
Scientific name: *Himantopus himantopus*

Order: **Charadriiformes**

Status: **Native – Not Threatened**

Habitat: **tropical estuaries and freshwater wetlands**

Pied stilts have long legs which allow them to wade in shallow water to feed without getting their bodies wet.



Takahē

Scientific name: *Porphyrio hochstetteri*

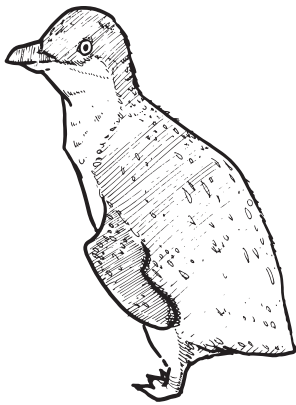
Order: Gruiformes

Status: Endemic – Recovering (at risk)

Habitat: grasslands

Takahē are much larger, brighter and have shorter legs than their pukeko relatives. They also cannot fly, making it difficult to escape introduced mammalian predators.

They were thought to be extinct for about 50 years but were rediscovered in 1948.



Kororā (Little penguin)

Scientific name: *Eudyptula minor*

Order: Sphenisciformes

Status: Native – Declining (at risk)

Habitat: marine, rocky coastlines.

Kororā are the world's smallest penguins at 25cm tall and weighing 1kg. Their flipper-like wings allow them to swim up to 6km/h.



Tūturiwhatu (New Zealand dotterel)

Scientific name: *Charadrius obscurus*

Order: Charadriiformes

Status: Endemic – Recovering (at risk)

Habitat: sandy beaches

Dotterels love to catch and eat their food at the beach – especially sandhoppers! Sadly, New Zealand dotterels don't have very successful breeding seasons due to tides, predators and human activity at the beach.



Pārekareka (Spotted shag)

Scientific name: *Stictocarbo punctatus*

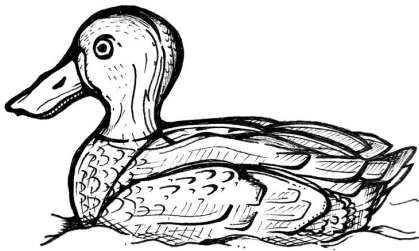
Order: **Pelecaniformes**

Status: **Endemic – Not Threatened**

Habitat: **coastlines of most New Zealand islands - marine**

They have a stunning double crest and bright blue-green eye mask.

Pārekareka dive into the ocean to feed on fish and squid. They have rangles (small stones) in their gizzard to help grind through bones and scales.



Kuruwhengi (Australian shoveler)

Scientific name: *Anas rhynchos*

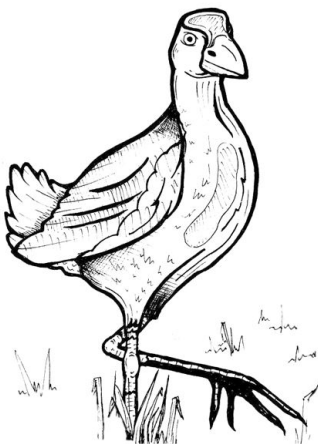
Order: **Anseriformes**

Status: **Native – Not Threatened**

Habitat: **estuaries and freshwater wetlands**

This shoveler is nationally protected in Australia. Shovelers have a fine curtain of lamellae* around the edge of their bill to filter plankton out of water.

*lamellae = a thin membrane with many folds



Pūkeko

Scientific name: *Porphyrio melanotus*

Order: **Gruiformes**

Status: **Native – Not Threatened**

Habitat: **farmland and grassy areas near freshwater wetlands**

Pūkeko can fly and are smaller than the endemic, flightless takahē. They live in complex social groups and work together to defend shared feeding grounds. Pairs will lay eggs in a single nest and raise chicks together as a group.



Antipodes Kākāriki

Scientific name: *Cyanoramphus unicolor*

Order: **Psittaciformes**

Status: **Endemic – Naturally Uncommon**

Habitat: **forest floor and areas of dense vegetation**

Unlike other species of kākāriki, they have an entirely green head and are only found on the Antipodes Islands. They forage and nest on the ground where they are vulnerable to predators.



Matuku (White-faced heron)

Scientific name: *Egretta novaehollandiae*

Order: **Ciconiiformes**

Status: **Native – Not Threatened**

Habitat: **rocky shores and estuaries; occasionally near lakes and farm ponds**

The matuku is now the most common heron in New Zealand, but originally flew here from nearby islands like Australia and New Guinea.