



Southern Seabird
Solutions



Southern Seabird Solutions

The Southern Seabird Solutions Trust fact sheets offer students an opportunity to explore the lives of seabirds. The lesson plans were created to assist teachers in helping students investigate and learn about seabirds, the important role seabirds play in their environment, and what impacts humans have on their ecology.

Learning outcomes

This resource provides students the opportunity to develop knowledge and understanding about

- why New Zealand is considered the seabird capital of the world;
- the special adaptations seabirds have so they can live at sea;
- seabird ecology;
- ecosystems, and understand why seabirds are important to their ecosystems;
- seabird migrations;
- pūrākau/legends and stories about manu moana/seabirds from Aotearoa/New Zealand;
- the status of individual species and how seabird populations are monitored and managed;
- human impacts on seabirds and positive actions that can be taken to improve their chance for survival.

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Others, including Pete McClelland (DOC) and Steve Cranwell (DOC), have shared useful information about specific species for these fact sheets.

Some of the seabirds you'll learn about in these fact sheets include:

Common name	Māori name	Scientific name
Arctic skua		<i>Stercorarius parasiticus</i>
Antipodean albatross		<i>Diomedea antipodensis</i>
Australasian gannet	tākapu/tākupu	<i>Morus serrator</i>
black-fronted tern	tarapiroe	<i>Sterna albobriata</i>
black petrel	tāiko	<i>Procellaria parkinsoni</i>
broad-billed prion	pararā	<i>Pachyptila vittata</i>
brown skua	hākoakoa	<i>Catharacta antarctica lonnbergi</i>
Buller's albatross		<i>Thalassarche bulleri</i>
Chatham tāiko		<i>Pterodroma magentae</i>
Cook's petrel	tītī	<i>Pterodroma cookii</i>
fairy prion	tītī wainui	<i>Pachyptila turtur</i>
grey petrel	kui	<i>Procellaria cinerea</i>
grey-faced petrel	ōi	<i>Pterodroma macroptera gouldi</i>
Hutton's shearwater		<i>Puffinus huttoni</i>
little blue penguin	kororā	<i>Eudyptula minor</i>
masked booby		<i>Sula dactylatra fullagari</i>
New Zealand fairy tern	tara-iti	<i>Sterna nereis davisae</i>
northern giant petrel	pāngurunguru	<i>Macronectes halli</i>
northern royal albatross	toroa-whakaingo	<i>Diomedea sanfordi</i>
sooty shearwater	tītī	<i>Puffinus griseus</i>
wandering albatross	toroa	<i>Diomedea exulans</i>
white-capped albatross		<i>Thalassarche steadi</i>
white-flipped penguin		<i>Eudyptula albosignata</i>
yellow-eyed penguin	hoiho	<i>Megadyptes antipodes</i>



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Seabird ecology

Where and how do seabirds nest?

New Zealand is often called the manu moana/seabird capital of the world because of the large number of seabirds that breed here—85 different species. Did you know that many of the seabirds that nest in New Zealand do not breed anywhere else in the world?

Although many seabirds do nest on the mainland most of our seabird species breed only on surrounding islands and rock stacks.

Key words

camouflage, burrow
kōhanga – nest
hua manu – egg
pīpī – chick

Manu moana - Seabird

kororā – little blue penguin
tara-iti – fairy tern

Different kinds of nests

Surface nesting

Some seabirds, like tara-iti/fairy terns, build nests that are simply scrapes in the sand, set in amongst broken seashells. The brown speckled eggs they lay and their chicks are well camouflaged from some predators—sometimes too well camouflaged! Many seabird and shorebird nests are in danger of being run over by vehicles or being trampled because they are so hard to see.

Camouflaged



Fairy tern chicks,
photo courtesy
DOC, GR Parrish

Many seabirds lay their ngā hua manu/eggs near the edges of steep cliffs. Does a cliff seem like a safe place to raise a pīpī/chick? Even though cliffs can be dangerous places, they are also hard places for some predators to reach and they provide the adult seabirds with easy access to food. For large seabirds, cliffs can also be easier places to take-off from.

Out on
the edge



White-capped albatross on nest, photo courtesy DOC, Peter McClelland



Burrowing in

Many seabirds build their nests in burrows or holes. For example, the kui/grey petrel builds an elaborate burrow with a tunnel that leads to a large, dry nest chamber with a mound of vegetation for the nest.

Other birds are not as fussy. Kororā/ little blue penguins will nest in underground burrows, in rock crevices, under houses and boat sheds, in stormwater pipes or even between railway tracks. Some of their burrow choices are not safe.

Person putting little blue penguin in penguin box, photo courtesy DOC, Neville Peat



Person putting little blue penguin in penguin box, photo courtesy DOC, Neville Peat

One way to make sure little blue penguins are nesting in secure places is to build nest boxes for them to use. All over New Zealand children and adults volunteer their time to build, place and monitor little blue penguin nest boxes. In many places the breeding success of little blue penguins that use nest boxes is higher than those that don't. Part of the reason for this is because the way nest boxes are designed stops two of the little blue penguin's biggest predators – dogs and cats – from being able to get in.

Little blue penguins peering out of burrow, photo courtesy DOC, Rod Morris



What you can do

People, pets and vehicles are a major threat to nesting birds. Make sure you stay away from areas where you know nests are and when you're on the beach watch where you're stepping. Try not to take vehicles on beaches or other bird nesting areas, especially during breeding season.

Remember, if you see eggs or chicks the chances are their parents are close by. Do not touch or remove eggs or chicks from their nests and move away from the area quickly – their parents won't return to the nest until you've gone.

Keep your dogs and cats in at night. Keep your dog on a lead at all times unless the area is posted as an off-lead area.



Black-fronted tern chick, photo courtesy DOC, Rod Morris



Seabird ecology

We're all in this together – seabird colonies

Colonial nesters

Each breeding season, millions of seabirds return to New Zealand to breed. These colonial nesters like to breed in the same spot as others of their species and often return to exactly the same nesting area.

There are many advantages to nesting in a colony: it's easier to find a mate, there is less competition from other bird species, young birds can learn from older birds, and there can be safety in numbers against natural predators.

What do you think might be some of the disadvantages? What happens if a disease or bad storm hits a colony? What about predators like rats or dogs or humans?

Key words

colony, fledgling

kaitiaki - guardian

kōhanga – nest

Manu moana – Seabird

Antipodean albatross

Hutton's shearwater

toroa-whakaingo – northern
royal albatross

Storm troubles

There are only about 20,000 toroa-whakaingo/northern royal albatross in the world and they all breed in New Zealand. Over 99 per cent of this species kōhanga/nest in the Chatham Islands and the rest nest at Taiaroa

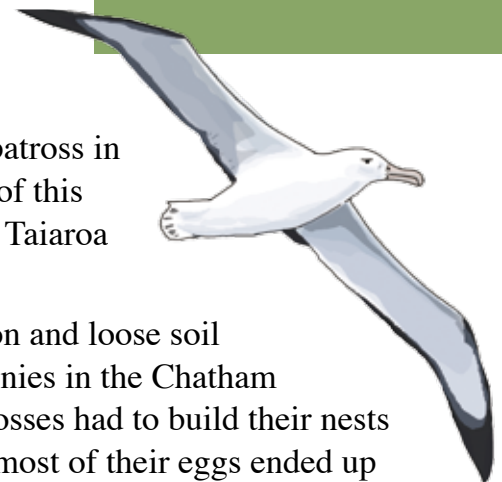
Head near Dunedin.

In 1985, a storm wiped out the vegetation and loose soil at the northern royal albatrosses' colonies in the Chatham Islands. After that storm the albatrosses had to build their nests out of stones or on bare rock and most of their eggs ended up breaking. Then in 1994 another storm with gusts of wind up to 188 kilometres per hour caused eggs to fall out of nests and break. The wind was so strong it even blew adult albatrosses off their nests.

Scientists believe that the northern royal albatross population in the Chatham Islands is still recovering from these bad storms. What do you think would happen if another disaster hit the albatross colonies in the Chatham Islands?



White-capped albatross, photo courtesy DOC, Fred Bruemmer



Building a new colony

Most seabirds prefer to return to where they were born to nest and raise their young, but there are exceptions. One of the most well known colonies to be established in recent history is the northern royal albatross colony at Taiaroa Head near Dunedin.

In 2003 a pair of Antipodean albatrosses began breeding on the Chatham Islands—a place where there is no record of them ever breeding before.

We don't know why some pairs of seabirds are willing to start new colonies, but we do know that having several colonies in different locations increases a species chances for survival. Can you think of reasons why?

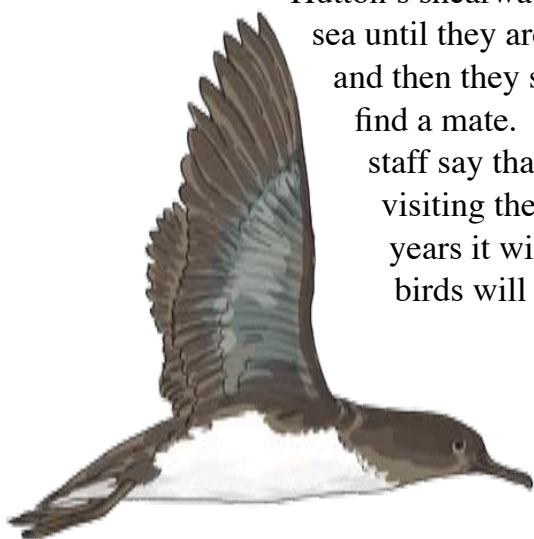
A little help

Sometimes conservationists give certain seabird species a nudge to start a new colony. They may do this by trying to lure nesting pairs to a location or by moving fledglings to a new spot.

One of the few seabird species that nests solely on the mainland, Hutton's shearwaters currently breed at only two sites. Establishing more breeding colonies is one way to ensure the survival of the species.

The Department of Conservation, Te Runanga o Kaikoura, Whale Watch Kaikoura, Kaikoura District Council and local Forest and Bird members have been working together as kaitiaki/guardians of Hutton's shearwaters by moving fledglings to a third location on the Kaikoura Peninsula.

Hutton's shearwaters spend most of their time at sea until they are at least four or five years old and then they start visiting the colony to find a mate. Department of Conservation staff say that if the transferred birds start visiting the new site in the next few years it will be a good sign the young birds will return there to breed.



Hutton's shearwater



Australasian gannet colony, photo courtesy DOC



Hutton's shearwater fledgling being fed, photo courtesy Paul McGahan



Hutton's shearwater fledgling fed a seafood smoothie, photo courtesy Paul McGahan



Seabird ecology

What makes a seabird a seabird?

**“Ka pā te muri, ka tangi te toroa, ki tōna kāinga i waho i te moana”
When the north wind blows, the albatross weeps for its home far
out on the ocean**

- Ngāi Tahu, Whakatauki

A manu moana/seabird is simply a bird that spends most of its life at sea. Seabirds forage at sea for food, either by themselves or in flocks.

Most seabirds even rest and sleep at sea on the waves, although some species do come ashore to roost at night.

All seabirds come to land to breed.

Adapted to a life at sea

To live at sea, seabirds have had to adapt to extreme conditions. For instance, many seabird species have denser bones than other birds. Their bone density helps them dive deeper while they're searching for food.

Salty solution

Most seabirds never drink a drop of freshwater in their lives. Instead they drink sea water. This means they build up lots of salt in their bodies that they need to get rid of. Most seabirds have salt glands above their eye sockets. These glands concentrate excess salt from the bird's water and food. When too much salt builds up in the gland the salt flows out or the seabird 'sneezes' it out.

The most common seabirds found in New Zealand are tītī/sooty shearwaters. They are members of the Procellariidae family. This family of birds is known as 'tube-noses' because of the tube on the top of their beak. The nostril tube is used for breathing and smelling, but it's also the way they rid their bodies of salt.

Key concepts

adaptation

ika – fish

Manu moana – Seabird

hoiho – yellow-eyed penguin

kororā – little blue penguin

tītī – sooty shearwater

toroa – wandering albatross

toroa-whakaingo – northern
royal albatross



Swim this way

Seabirds have all different lengths of legs and types of feet. Seabirds that spend most of their time on the ocean usually have short, thick legs and webbed feet. They use their short legs like oars and their webbed feet work like paddles.

A sooty shearwater 'flying' underwater. Photo: Kim Westerskov



Beaks, beaks, beaks

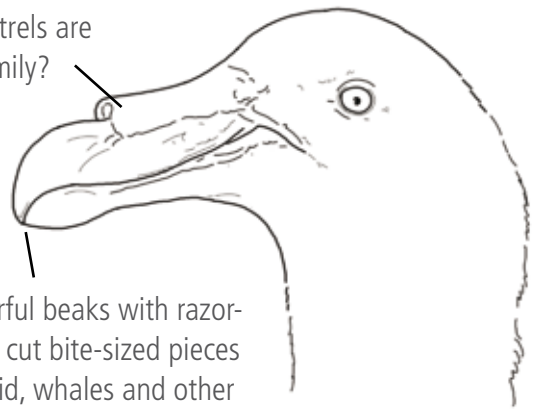
Most seabirds have a great sense of smell that helps them find food—even when it's kilometres away.

Photo: Tui de Roy, Roving Tortoise



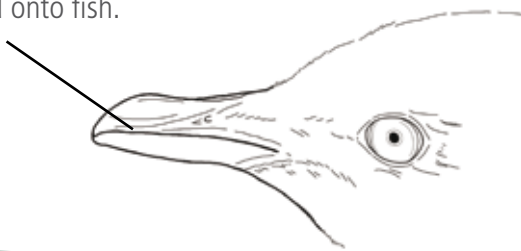
Powerful and razor sharp

Can you see why giant petrels are part of the 'tube-nose' family?



Giant petrels have powerful beaks with razor-sharp sides to help them cut bite-sized pieces off of dead seabirds, squid, whales and other marine creatures.

The sides of a penguin's beak are sharp with rough spines on the inside to help it hold onto fish.



Sharp with spines



Photo: DOC

Photo: DOC



Strong and streamlined

Australasian gannets have beaks that are strong and streamlined with their bodies to help them with their diving.



Birds of a different feather

Seabirds have a preen gland that helps make their feathers waterproof. They also have thick layers of feathers that help keep them warm and dry.

Winging it

Some seabirds like kororā/little blue penguins and hoiho/yellow-eyed penguins can't fly in the air at all; instead their wings help them to 'fly' underwater to catch their prey.

Other seabirds are built to fly long distances.

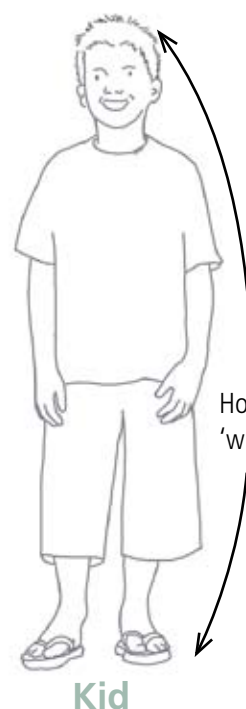
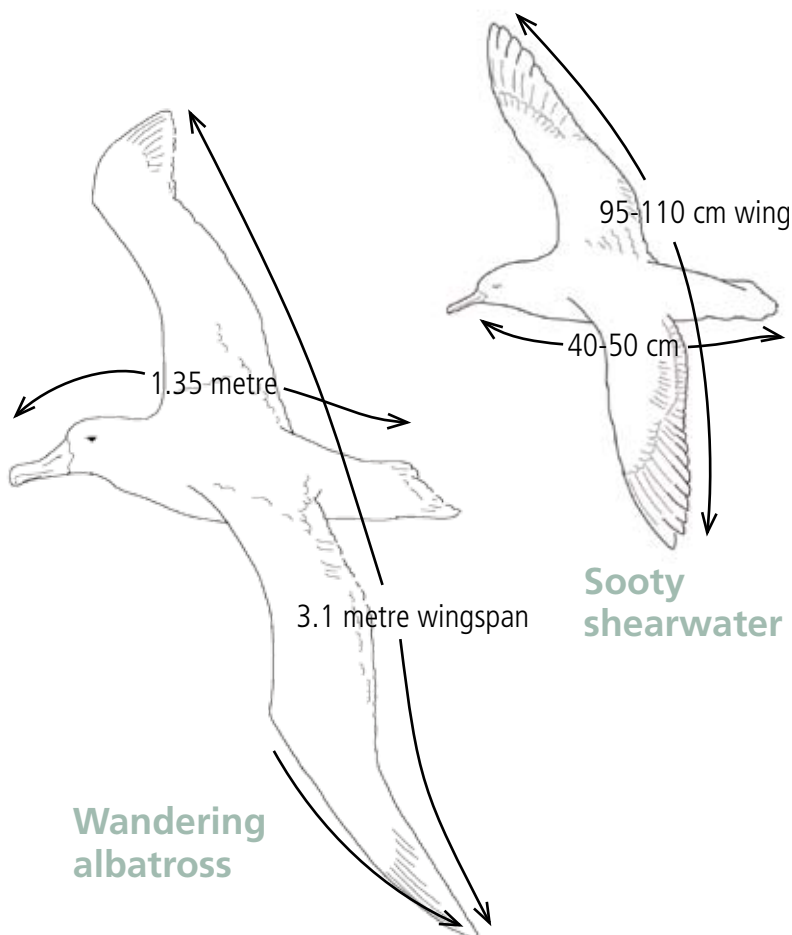
Albatrosses and petrels are considered the greatest long distance flyers of all the seabirds. They have small bodies in relation to their wings to make flight easier. Their long, slender wings help them glide on the wind.

The toroa/wandering albatross can have a wingspan up to 3.6 metres. How does that compare to your height?

Did you know that toroa-whakaingo/northern royal albatross sometimes fly up to 1800 kilometres in a single day?



Black-fronted tern in flight, photo courtesy DOC, Chris Smuts-Kennedy



"Seagull, seagull,
Riding high,
What do you see,
With your bold, bright
eye?"
-James K Baxter

How does your height and
'wingspan' compare?



Seabird ecology

Fishing for food

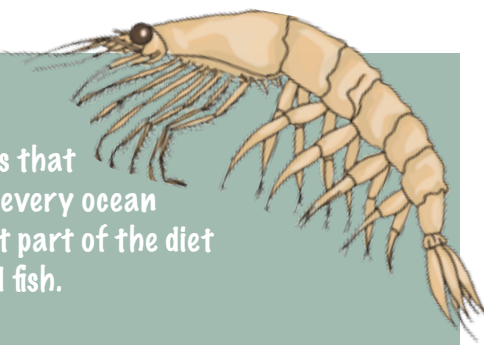
Searching for food at sea takes a lot of energy and skill. To find food at sea, different seabird species have adapted to feed on the moana/ocean's surface, to ruku/dive, to scavenge, or to prey on the eggs and chicks of other seabirds.

Surface deep

Marine currents can push krill, fish and squid up to the ocean's surface. Keen eyesight, great sense of smell and the ability to travel great distances are three adaptations that help seabirds find these marine smorgasbords. Sometimes seabirds will follow dolphins and whales to catch small ika/fish that have been disturbed.

What are krill?

Krill are small marine invertebrates that look like shrimp. They are found in every ocean in the world. Krill are an important part of the diet of many whales, seabirds, squid and fish.



Plastic food

Sometimes seabirds mistake small pieces of plastic floating in the water for food. Not only is plastic bad for them, if their stomachs are full of plastic they can starve to death.

It has been reported that more than one million seabirds die globally each year from being tangled up in or eating plastic.

Key words

adaptation

ika – fish

heke – migrate

moana – ocean, sea

ruku – dive

Manu moana – Seabird

hākoakoa – brown skua

masked booby

pāngurunguru – northern giant
petrel

tākapu – Australasian gannet

tītī – sooty shearwater



Plastic is a major threat to seabirds and other marine life, photo courtesy DOC

The Southern hemisphere has less plastic in its oceans than the Northern hemisphere, but because many seabirds heke/migrate it's a global issue. Where do you think the plastic comes from? What can we do to stop our oceans from being polluted?



Black-backed gull, photo courtesy Rod Morris



Green Teens Sophie Turner, Brittany Packer and Abby Ward earned YHA Young Conservationist Awards in 2006 for their work to reduce the number of plastic shopping bags people in Nelson use, photo courtesy of YHA, Mardi Neumann

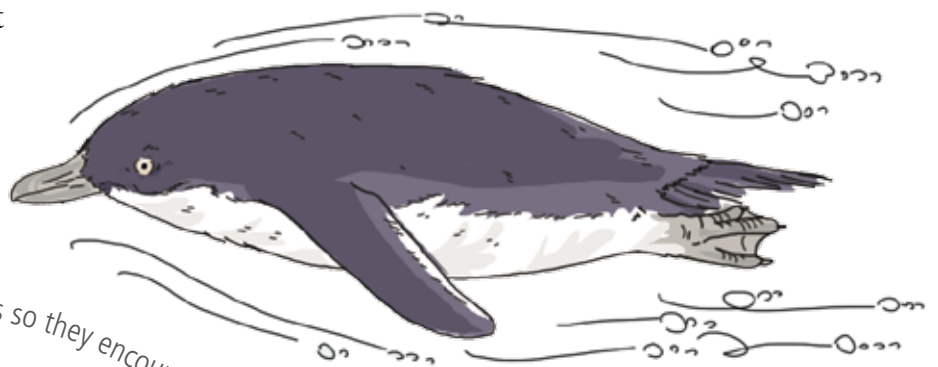
Plastic bag free

The Golden Bay community of Collingwood was the first New Zealand town to become plastic shopping bag free. Even though it's a small community, it's estimated that they were using one million plastic shopping bags each year before they went plastic bag free.

New Zealand-wide, we use more than 800 million bags each year.

Hot pursuit

Seabirds often fish for food by diving. Some dive while they're in the water. This is called pursuit diving. Penguins can't fly in the sky, but they can fly underwater as some of the greatest pursuit divers in the world. Many pursuit divers are better adapted to being in the water than to being on land or in the air.



Penguin bodies are tapered at both ends so they encounter little resistance as they push through the dense medium of water.

Taking the plunge

Plunge diving is diving into the water from high above the sea. In New Zealand only tākapu/Australasian gannets, masked boobies and some terns are true plunge divers.



At Te Matau a Māui (Māui's fish hook)/Cape Kidnappers gannet colonies people can watch as tākapu/Australasian gannets plunge dive into the ocean for their food.

When a hunting gannet sights a fish it will plummet into the water at speeds up to 145 kilometres an hour. Gannets can dive to depths of more than 15 metres in pursuit of their prey.

Gannets are specially built for plunge diving. Their skull is super strong to withstand the shock of hitting water at high speeds. They also have special air sacs that cushion the impact.

Opportunity knocks

Gulls, skuas and giant petrels will eat the eggs and young of other seabirds. Brown skuas patrol seabird colonies in search of untended eggs and chicks to eat. They also catch many adult petrels. These birds are known as opportunists.

Dangerous meals

Many seabirds also scavenge for food. Seabirds that scavenge are at great risk when they forage around fishing vessels.

In the trawl fishery seabirds sometimes get injured or killed by the steel cables that tow the trawl net and other seabirds get caught in the net itself and drown.

In fisheries that use hooks instead of nets seabirds try and take the bait off the hook and sometimes get hooked themselves and drown.

In New Zealand, many fishing vessels use devices that scare away the seabirds so the birds are less likely to get hurt. Southern Seabird Solutions, fishermen, government officials, scientists, conservationists and others are working to find other solutions to stop seabirds from being killed by fishing equipment.



Seabirds follow fishing vessel, photo courtesy Southern Seabird Solutions Fishers Photograph Competition

Brown skua dining on the remains of a Chatham Island little blue penguin, photo courtesy of DOC, Don Merton





Seabirds and people

Seabirds count – seabird populations in New Zealand

Scientists spend time learning how many seabirds there are, where seabirds nest, and details about their breeding, migrating and eating habits. Some of this information helps determine how seabirds are doing.

Going, going, gone?

Throughout New Zealand's history some plants and animals have become extinct. When a species is extinct, there are no more of them alive anywhere in the world.

Māori hunted many of New Zealand's birds and introduced predators like kiore/rats and kurī/dogs. Most people know about moa becoming extinct during this time, but some other birds did too, including the giant Haast's eagle and Scarlett's duck.

With the arrival of Europeans, there were big changes made to the land and sea, along with increased hunting and the introduction of predators like stoats and cats. During this time still more species became extinct, including birds like the huia and piopio.



Placing sooty shearwater in burrow, photo courtesy DOC, Christine Jacobson

What are we doing to stop seabirds from becoming extinct?

All around New Zealand people are working to help our seabirds. School students are restoring nesting habitats, people are trapping predators, and others are developing ways to keep seabirds away from fishing boats so that the seabirds won't accidentally be caught on hooks or in nets.

Key words

endangered

Aotearoa – New Zealand

ngaro – extinct

tatau – count

Manu moana – Seabird

Chatham tāiko

tarapiroe – black-fronted tern

tara-iti – fairy tern

toroa-whakaingo – northern royal albatross

white-flipped penguin

There are only 40 New Zealand fairy terns in the whole world. How does that number compare to the number of kids in your classroom?

Like the moa

The phrase 'he manu ngaro te moa ināianei' means the moa is now an extinct bird. Sometimes the phrase is used as a reminder that over-harvesting can lead to extinction, just like what happened to the moa.

Some of New Zealand's most endangered seabirds



(Specify pages 14-16)
A list of some of New Zealand's endangered seabirds

Seabird	Population	Where they nest	Main reason they are endangered
tara-iti/New Zealand fairy tern	critically endangered – 40	Breeds in Northland at Papakanui Spit, Mangawhai and Waipu estuaries.	Predators, disturbance by people, and nesting habitat loss.
toroa-whakaingo/northern royal albatross	up to 20,000	Breeds at the Chatham Islands and Taiaroa Head.	Storms have destroyed their nesting habitat at the Chathams. Longline fishing is also a threat.
white-flipped penguin	about 4,200	Breeds on Motunau Island and at Banks Peninsula, Canterbury.	Introduced predators (especially ferrets and dogs) and near-shore set nets.
tarapiroe/black-fronted tern	between 2,000 and 10,000	Breeds in riverbeds in the eastern South Island.	Introduced predators including ferrets, stoats, rats, hedgehogs and dogs. Loss of nesting habitat.
Chatham tāiko	critically endangered – 100 – 150	Breeds on Chatham Island	Predation by cats, rats, pigs and possums.

Count-down at Taiaroa Head

At Taiaroa Head, scientists, volunteers and Department of Conservation staff know every toroa-whakaingo/northern royal albatross in the colony. There are a total of 40 nesting pairs that return to the colony to breed along with 50 single albatrosses.

In a normal breeding year nearly all the nesting pairs successfully lay eggs at Taiaroa Head. In 2005/2006 only 12 eggs were laid. That's a concern for head ranger Lyndon Perriman.

Northern royal albatross pair at nest,
photo courtesy DOC, MF Soper



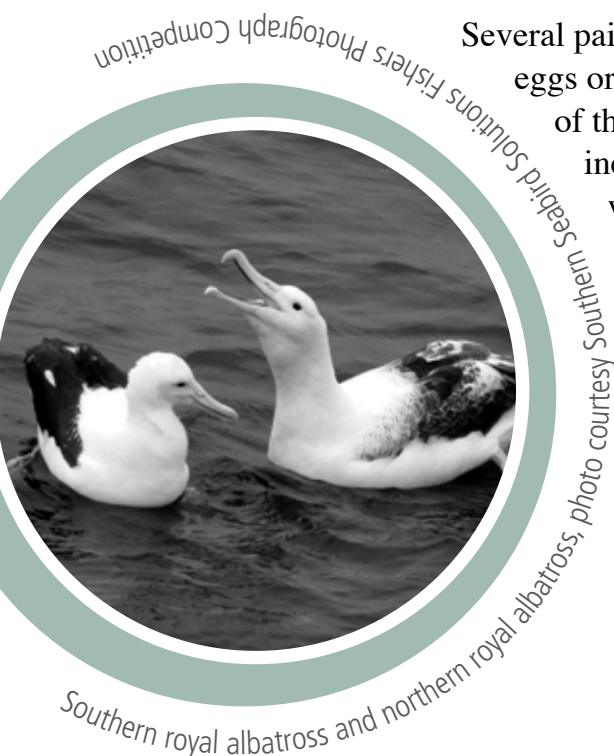
“Northern royal albatrosses only breed every other year, and each nesting pair puts a lot of energy into raising their chicks over an 11-month period,” he explains. “Because northern royal albatrosses are endangered, every single chick hatched becomes important to the survival of the species.”

Egg numbers at the colony were low for a number of reasons. When the breeding season began five adults returned without their mates. “Unfortunately their partners are most likely dead. Northern royal albatrosses tend to mate with the same partner, so it can take up to three years for them to find another mate,” Lyndon says.

Several pairs that did return did not lay eggs or laid infertile eggs. “Some of the pairs are young and inexperienced at nesting, plus we have an older couple that in human terms seems to be going through a divorce. Hopefully all these birds will survive and return in two years to successfully breed.”



Northern royal albatross guarding chick, photo courtesy DOC, AE Wright





Seabird ecology

The big OE –New Zealand seabird migrations

There are over 8600 identified bird species in the world and only 359 of them are considered manu moana/seabirds. That's a pretty small number of seabirds when you consider that the ocean covers 72 per cent of the Earth's surface and contains 97 per cent of the Earth's water. But life at sea for birds is a challenge and seabirds have had to specially adapt to travel and hunt in a salt-water environment.

New Zealand has 85 species of seabirds that nest on the mainland and offshore islands. Some of these seabirds stay in New Zealand waters year-round, others heke/migrate and only return to New Zealand to breed.

Animals usually migrate seasonally following food sources and weather patterns.

A wrong turn

Hutton's shearwaters only breed in two places in the Kaikoura Seaward Mountains, not too far from the town of Kaikoura.

In 2006 there were a series of bad storms right when the Hutton's shearwater fledglings were about to take their first flight all the way to Australia. The wet and misty conditions meant that many of the young, inexperienced flyers became disoriented by Kaikoura's lights and ended up in backyards and on streets all over town.



A tracking tag on the leg of a white-capped albatross, photo courtesy David Thompson, NMWA

Key words

moult

heke – migrate

Manu moana – Seabird

Hutton's shearwater

tītī – sooty shearwater and
Cook's petrel

Tag...you're it

There are some seabird species that we know very little about. But electronic tracking tags are helping scientists learn more about some seabirds and other migrating animals.

By attaching tracking tags to certain species of seabirds, scientists have confirmed that many seabirds spend up to 90 per cent of their lives at sea.

A dedicated group of volunteers and Department of Conservation staff were able to collect 160 of the fledglings and nurse them back to health. The young seabirds were taken to a safe location where they were fed and allowed to rest before starting off on their journey again.

The longest migration



Sooty shearwaters follow an 'endless summer' around the Pacific Ocean in search of food

Scientists recently used tracking tags to track 19 tītī from two different breeding colonies in New Zealand. What the scientists discovered is that the migration routes of the tītī represent the longest recorded migration of any animal ever tracked.

“We know that many species of albatross, along with Arctic terns and Cory’s shearwaters travel great distances too, so the record may be broken in the future, but what we found after tracking the sooty shearwaters is that they each travelled on average 64,000 kilometres in less than a year’s time,” says Department of Conservation scientist Graeme Taylor.

The tracked sooty shearwaters flew across the entire Pacific Ocean, from Antarctic waters to the Bering Sea and from Japan to Chile. The sooty shearwaters fly in a figure-of-eight migration pattern and seem to use global wind patterns to increase their flight speeds and reduce the amount of energy they use.

Although sooty shearwaters number in the millions, their numbers are dropping. Scientists hope that the information gained by studying sooty shearwaters at sea might also help us understand why there aren’t as many sooty shearwaters as there used to be.



Seabird ecology

Raising their young

Of the world's **359 manu moana/seabird species** nearly one-quarter (**85 species**) breed in New Zealand. Of these **85 species 35** breed nowhere else in the world.

Each seabird species courts, mates and raises their young in slightly different ways. Some seabirds build their nests on cliffs and others build theirs at beaches just above the high-tide line. Most seabird species breed every year, but some large species only breed every other year. Most seabirds mate with the same partner breeding season after breeding season.

It takes two

Seabird parents share the responsibility of raising their young. They take turns foraging at sea and staying at the nest to incubate ngā hua manu/eggs and guard the young chicks.

Shag, gull and tern parents take short trips in search of food and relieve each other of nest duty on at least a daily basis. Other seabirds may go out to sea in search of food for up to two weeks before they return to take over guarding the nest.

Albatrosses, shearwaters and petrels all belong to the Order Procellariiformes. The long-lived seabirds in this group are slow breeders. Most species do not breed until they are at least four years old and some like the giant petrel and several albatrosses don't breed until they are about 10 years old. That isn't old for humans, but compared to other birds that's ancient!



Australasian gannets courtship display, photo courtesy DOC, Rod Morris

Key words

displays, regurgitation, incubate, foraging

hua manu – egg

kōhanga – nest

pīpī – chick

Manu moana – Seabird

Buller's albatross

Chatham tāiko

pāngurunguru – northern giant petrel

toroa-whakaingo – northern royal albatross

Displays of affection

Toroa-whakaingo/northern royal albatross usually only breed every other year. Even though most albatross mate with the same partner for life they still have courting rituals.

Courtship displays include bill clapping, preening each other, opening their wings and sky calling. To sky call the albatross calls out while pointing its beak toward the sky.

Procellariiformes usually lay only one egg. The parents take turns incubating the egg. When the egg hatches the parents continue taking turns guarding the chick until it's old enough to be left alone. As the pīpī/chick gets older it needs more and more food so both parents need to leave the nest for long periods of time to search for enough food to feed themselves and their growing chick.

If something happens to one of the parents during the breeding season it can mean that the chick and even the other parent could die. It takes so much energy to raise a chick that both parents need to be involved the whole time.



Fairy prion pair at nest, photo courtesy DOC, Rod Morris



White-capped albatross courtship display, photo courtesy DOC, CJR Robertson

Seafood smoothies

Parents feed their chicks by regurgitating food that they've eaten while foraging at sea. The reflex for the parents is a lot like vomiting. Although it doesn't sound appetising to us, what comes out of the parent's mouth is energy-rich food that helps their young survive.

Time to fly

The length of time seabirds spend at their breeding colonies ranges from several weeks to nearly a year. Parents may stop feeding their young and quit returning to the breeding colony several weeks before their fledglings are able to take off on their own.

It's hard to believe, but by the time the adults leave the colony most fledglings are able to defend themselves against their natural predators. But introduced predators (e.g. rats, stoats, ferrets, dogs and cats) pose a threat to the young birds.

People in New Zealand are working to remove introduced predators from many of our offshore islands. In places where all introduced pests and predators can't be removed traps and fences are placed around nesting areas.



White-flippered penguin, photo courtesy DOC, Peter Reese



Buller's albatross, photo courtesy Southern Seabird Solutions



Seabird ecology

Seabirds and their environment

Seabirds are a bit like gardeners in the areas where they nest. Some seabirds disperse seeds and spores from their feathers and droppings (guano). Scientists also believe that the way seabirds disturb the soil as they're building their nests may be important to island plants.

Seabirds' guano along with spilt regurgitations for their chicks and even unhatched eggs provide rich fertilisation for many of our native plants.

Seabirds also help other animals. The burrows that seabirds like petrels and shearwaters build create safe, sheltered and humid homes for lizards, tuatara and insects.

Key words

guano, regurgitation, ecosystem

rāhui – ban or restriction put in place to protect an area or its resources

Manu moana – Seabird

tītī wainui – fairy prion

What is an ecosystem?

The word ecosystem is short for ecological system. An ecosystem is the sum of all the relationships between plants, animals and their surrounding environment in a specific area. What types of things do you think affect ecosystems (i.e. soil type, weather) and what happens if something changes in an ecosystem?

Seabirds used to breed across New Zealand. Scientists believe that many mainland New Zealand ecosystems were part of a vast ecosystem that seabirds were an important part of. The loss of millions of seabirds over the last 1000 years means that the ecosystem is now broken up.

Weird neighbours

Scientists have studied tuatara on Takapourewa/Stephens Island in Cook Strait and found that this endangered reptile will frequently live with nesting tītī wainui/fairy prions in the same burrow.

Tuatara eat fairy prion eggs and chicks – sometimes even the ones they're sharing a burrow with! Still, tuatara don't seem to have much of an impact on fairy prion numbers. Studies show that the number of chicks that die in seabird colonies where tuatara are present isn't any greater than in seabird colonies without.



Prospecting guano

Did you know that guano is rich in phosphate and is considered some of the best fertiliser in the world? Beginning in the 18th Century phosphate rocks made up of guano and limestone were mined on many islands and atolls in the Pacific like Nauru.

The smallest independent republic in the world, Nauru's main industry since 1907 has been phosphate mining. Much of the mined guano-rich fertiliser ended up in New Zealand and Australia where it was used for growing crops.

Nauru, like many of the islands that were mined for phosphate, has had most of its soil and vegetation stripped away as a result of the mining. This means that people in Nauru are not able to grow their own food and the loss of vegetation means that the interior of the island gets very hot and is now prone to droughts.

Ngā Motu/Sugar Loaf Islands

The Ngā Motu/Sugar Loaf Islands are the only offshore islands in the Taranaki and Manawatu regions. Nineteen different species of seabirds use the islands with approximately 10,000 seabirds nesting there.

The islands and surrounding waters are protected as the Sugar Loaf Islands Marine Protected Area and supported by a traditional Māori rāhui/temporary ban or restriction over the area.

Seabirds on a guano-covered rock, photo courtesy of Southern Seabird Solutions



Chatham Islands

In 2006 a group of researchers led by Department of Conservation botanist Peter de Lange found several plants on the Chatham Islands that had never been recorded there before.

One of the plants discovered was a daisy that's commonly called muttonbird groundsel. The flowering plant has been described as "guano-loving" and was found in an area where seabirds are found. The daisy is just one of many coastal plants that seem to depend on seabirds for its survival.

Things you can do to protect our seabirds...

- When on a boat – keep our islands safe. Observe landing restrictions on island sanctuaries. Check boats and luggage for rats before coming ashore.
- If you find a sick or dying bird on the beach, it's usually best to leave it alone. If a bird is obviously injured you could take it to your nearest Bird Rescue Centre. If you see a seabird that's tangled up in plastic and you can safely capture it, ask an adult to help you remove the plastic.
- Little blue penguins shed their feathers between late December and March, which takes 10-18 days. They don't eat during this time because they lose their water-proofed feathers and are unable to go to sea to fish until they grow new ones. Moulting penguins look quite scruffy. If you come across one let it rest and keep your dog and other predators away from it.
- Off-road vehicle users – don't drive on riverbeds or beaches where birds are nesting or roosting – this can upset colonies and destroy nests.
- Care for the coast – projects such as planting and fencing coastal areas can help provide habitats for nesting birds.
- If you find a dead bird with a band on its leg, return the band to: The National Banding Office, Department of Conservation, Box 10-420, Wellington.



Seabirds and people

The impacts of fishing on seabirds

In recent times many seabird species have become threatened or endangered. Some of the greatest threats to seabirds today include loss of habitat, introduced predators, being caught or killed in fishing nets or on baited hooks, eating or becoming tangled up in plastic, oil spills and climate change.

"Most fishermen consider seabirds our friends at sea. When you're out on a fishing boat just the sight of an albatross soaring in the sky above can lift your spirits."

-David Kellian, fisherman

Key words

threats, endangered,
longlining, trawl fisheries

Manu moana - Seabird

toroa – albatross

Fishing for solutions

Fishing is an important part of New Zealand's economy. It's also been an important part of our history ever since Kupe and his followers landed here. But sometimes fishing poses a major threat to our seabirds both in New Zealand and overseas.

Southern Seabird Solutions is a group of fishermen, scientists, government officials and conservationists working to reduce the numbers of seabirds accidentally killed.

Longlines

Albatrosses are one of the world's most endangered family of birds. One of the main causes of their decline has been longline fishing. Longline fishermen set lines up to 95 kilometres in length behind their boats. Attached to each line are hundreds to thousands of baited hooks to catch fish like tuna, swordfish and Patagonian toothfish.

Seabirds see the baited hooks and try to eat the bait. Unfortunately sometimes the seabirds get caught by the hook or tangled up in the line. Every year thousands of seabirds drown and die this way all around the world.



Weighting lines so that the bait drops out of view more quickly, setting hooks at night, and flying bird-scaring lines can help to save thousands of birds each year.

In New Zealand some of these techniques are required by law. Many fishermen use these techniques and along with government officials, scientists and conservationists are working on other ways to stop seabirds accidentally being killed.

Pirates

One of the biggest concerns for seabirds, marine mammals and fish stocks is illegal fishing, which is called pirate fishing. It's estimated that pirate fishers are responsible for half the seabirds killed by longlining. Pirate fishers also reduce the amount of fish legal fishermen can take and deplete fish stocks for future years. Pirates do not fish close to New Zealand but seabirds fly to the high seas where pirates may operate.

Trawl fleets

The trawl vessel fleets in New Zealand and other parts of the world use large nets to catch squid and fish. Seabirds sometimes get caught in the nets or struck by the large cables used to tow the nets.

The trawl fishery in New Zealand is trying to reduce the number of seabirds killed and injured by their vessels each year. Flying scaring lines from the trawler is one solution, but the trawl fishery is also looking at ways to manage offal (the fish waste that is released from the boat after the fish are processed). Offal is a big attraction to seabirds that gorge themselves on it. Some people compare offal to fast-food restaurants for seabirds.

When seabirds come near the fishing boats to eat the offal they're much more likely to accidentally be injured or killed by fishing equipment as they forget danger and chase the food. Many individuals and groups like Southern Seabird Solutions, the Department of Conservation, the Ministry of Fisheries and fishing organisations are looking for an answer to this problem.



Smaller seabirds are particularly vulnerable to being accidentally captured in trawl nets, photo courtesy Southern Seabird Solutions



Photo courtesy Southern Seabird Solutions

Throwing seabirds a lifeline

New Zealand fisherman Chris Carey won an international prize for a contraption he invented to scare birds away from the cables of a trawl vessel.

Chris calls his invention the 'flying bottlebrush' or 'carefree's cunning contraption'. The device is a rope that has streamers made from strapping tape on it. The contraption can be clipped on to a fishing vessel's cables. The streamers help the birds see where the cable is so that they don't fly into it or get hit by it.

The judges liked Chris' invention because it's simple to make and use. The device is currently being tested in New Zealand.



Seabirds and people

The cultural importance of seabirds

Myths and legends

There are many stories about seabirds from Māori tradition. One story that is told on the west coast of the North Island is about a young man named Monoa.

When Monoa went down to the sea one day his enemies were hiding there and waiting for him. Monoa ran and tried to hide amongst birds like shags, black-backed gulls and oystercatchers, but each time his enemies could easily see him and chase him. Monoa saw a flock of terns and decided to hide in amongst them. There were so many terns that his enemies couldn't see him. Monoa hid until his enemies all left and then he went back to his home.

Why do you think he was able to hide from his enemies amongst the terns? Could Monoa do that today?

Source: The Illustrated Encyclopedia of Māori Myth and Legend by Margaret Orbell

Weaving our past to our present

Birds of significance

Māori harvested some types of seabirds for kai/food. They also gathered seabird feathers to make cloaks and hair adornments. Seabird bones were used to make fishing hooks and musical instruments. The bones were also fashioned into chisels that were used to engrave moko/tattoos on people.

Toroa/albatross are of spiritual importance to a number of iwi. For iwi who are affiliated with Taranaki and the teachings of Te Whiti o Rongomai and Tohu Kakahi, the white raukura/feather of the albatross is the symbol of peace and Parihaka's non-violent resistance movement.

Key words

Aotearoa – New Zealand

kai – food

kaitiaki – guardian

kaitiakitanga – guardianship

rauкура – feathers

Manu moana

ōi – grey-faced petrel

tītī – sooty shearwater

toroa – albatross



Portrait of an unidentified Māori woman. Photographer: Thomas Pringle 1858-1931. 1905. Alexander Turnbull Library, Wellington, N.Z.

Tītapu

Because of their beauty and scarcity, feathers from albatrosses were of special value to Māori. Known as Tītapu, the feathers from albatrosses were normally worn by high-ranking individuals. In fact the phrase "te rau o Tītapu" (Tītapu's plume) is a way of showing respect for a person.

There are many different stories about where the name Tītapu comes from. In one Māori legend, Tītapu was an island in Raukawa/Cook Strait where many albatrosses lived. One day the island sank and the albatrosses lost their home.

Source: *The Illustrated Encyclopedia of Māori Myth and Legend* by Margaret Orbell



Reproduction of Māori rock drawing. Alexander Turnbull Library

Tufts of toroa raukura/feathers are worn by Moriori from the Chatham Islands to show their commitment to Nunuku Whenua's covenant. As a Moriori chief nearly 500 years ago, Nunuku Whenua became sickened by warring and bloodshed. He gave an order to all his people stating that from that day forward people were only allowed to fight until first blood was drawn and then the fighting must stop.



When Europeans arrived they too harvested seabirds, in fact many birds were hunted nearly to extinction in the 1800s because of the feather trade. During Victorian times people gathered eggs for scientific and personal collections. During this time many seabird species were at risk of disappearing forever.

Today, most seabird species numbers are so low that even killing a few might endanger the entire species. For this reason most seabird harvesting is illegal in New Zealand.

Troops from the Māori Battalion with barrels containing tītī/sooty shearwaters for a Christmas meal in Italy. War History Collection, Alexander Turnbull Library.

Sustaining traditions

Two seabird species that are still legally harvested include the tītī/sooty shearwater and ōi/grey-faced petrel. The chicks of both species have been traditionally gathered by Māori.

Tītī, which are also called muttonbirds, are the most numerous of all the seabirds in New Zealand. They have an estimated global population of 20 million and breed in many parts of the Southern hemisphere.

As kaitiaki/guardians of the Tītī Islands, Rakiura/Stewart Island and Murihiku/Southland Māori have sustainably harvested tītī for centuries.

Kaitiakitanga is an ethic where people who use a resource have an obligation to maintain it for their children and their children's children. One way Rakiura and Murihiku Māori are practising kaitiakitanga now is by working with researchers to track tītī numbers and look at ways they can continue to harvest tītī that doesn't reduce the population.

People involved with the project hope that the 14-year research programme will increase understanding of the way kaitiakitanga, mātauranga (traditional environmental knowledge) and science can help each other in conserving our natural resources.

Even though there are millions of tītī left, their numbers have fallen by 30–40 per cent over the last 20 years. Scientists think there are a number of reasons for their population decline including climate change and the accidental catching of tītī in commercial fisheries all over the world.



Moko/face tattoo pattern used by a New Zealand chief to sign a land deed in 1840. Dominion Post Collection, Alexander Turnbull Library

Keeping traditions alive

New Zealanders are working hard to reduce the number of seabirds accidentally caught by fishing vessels, but sometimes seabirds are killed this way. These dead birds are sent to scientists who perform an autopsy on them to learn more about the species.

The Department of Conservation then provides some of these seabirds to tangata whenua upon request. These seabird bones and feathers can be used for many traditional purposes—from making musical instruments to being sewn into a ceremonial cloak.

Museums and other organisations also sometimes request these seabirds so that they can put them on display and use them for educational purposes.