A Seabird At The Top Of The Mountains



Hutton's Shearwater/ tītī

Kaikoura—their last place on earth. Education Pack

Year 4,5,6





Department of Conservation Te Papa Atawbai

Introduction

Vision and goal:

To ensure that each of our Kaikoura children are aware of, knowledgeable about and proud of the Hutton's Shearwater; Kaikoura being their last place on earth.

That we ensure each student is exposed to a formal learning process in their school curriculum twice during their education, once at Year 6 level and once at Year 9 level.

Primary level learning outcomes

Learning areas

- Science
- Social sciences

Learning outcomes

- Students will investigate the impact humans have on the ecology of Hutton's Shearwater in particular and sea birds in general.
- Students will understand how people view and use places differently
- Students will investigate sea bird adaptations
- Students will research sea bird life processes and ecology

Links to curriculum

- Science: Living world: Ecology, Life processes
- Nature of science: Understanding about science, Participating and contributing

Geographical location for topic

• Kaikoura

Theme

- Animals
- People
- Marine



Partners

The Hutton's Shearwater Charitable Trust was formed in October 2008 to: *encourage and promote the preservation, conservation, research, public education, and sustainable management of the Hutton's shearwater.*



Department of Conservation *Te Papa Atawhai*











Cover illustration created from a Dennis Buurman Photography image.

Share the Knowledge

Students will work in groups to create a visual presentation (drawing and using words) about one aspect of the Hutton's Shearwater.

		Doing the Activity
Materials needed:Copies of Hutton's		Organize students into five groups.
	Shearwater Informa- tion Cards	Give each group one of the Hutton's Shearwater information cards.
•	Poster Paper	
•	Art and craft materials	The group should read the information card and then agree on
•	Optional print outs of Hutton's Pictures (from	two or three of the most interesting or important facts they think the other students should know.
	internet, try http:// www.arkive.org/huttons- shearwater)	Groups then prepare a "poster", pictures and words to present their interesting facts back to the group.
		Remind students that their poster should be based only on the piece of information they have been given.

Groups then present their posters to the class (or at an assembly).



Hutton's Description

Hutton's shearwater/tītī (*Puffinus huttoni*) is the only New Zealand seabird that breeds in the mountains, high above the snowline. The species is in danger of becoming extinct if we don't do something to help conserve them.

The Hutton's shearwater is a small black/brown and white shearwater, 36-38 cm in length with a wingspan of about 75 cm or the size of a common red-billed seagull, Hutton's shearwater are thought to live for about 30 years. The male and female Hutton's Shearwater are almost identical to look at.

The back of body is uniform brownish black. The dark brown of the head extends below the eye merging into the white of the chin and throat. The back of the neck is also dark brown and the colour extends down to form a broad collar almost encircling the neck and upper breast. The rest of the under-body extending from the lower breast to the under-tail feathers is white except for a small dark patch on the thigh and the sides of the under-tail feathers.

The under-wing is off white with broad brownish borders with extensive dusky grey armpits. The bill is long, slender, and dark grey. The eyes are brown. The leg is light pink on the inside and pink to almost grey outside. The feet are pink with black webs.

During spring and summer, large flocks can often be spotted just offshore from the Kaikoura coastline, flying low over the sea or rafted up in large groups on the water.



Hutton's shearwater/tītī Puffinus huttoni

Life cycle of a Hutton's Shearwater

The Hutton's Shearwater is the only New Zealand seabird that breeds high up in the mountains, where it becomes too cold for even trees to grow. Around March/April each year, Hutton's shearwater migrate across the Tasman to spend the winter in Australian waters. They return to their mountain breeding colonies in August. Their burrows are often still buried under snow but when it melts they relocate their burrows (0.6—2.5 metres in length) amongst the tussock and lay a single egg between the end of October to mid November.

The egg is laid in a nest, in a hollowed out chamber (about the size of a shoe box). The nest is made of tussock grass and sticks and lined with feathers.

The egg is incubated (kept warm by one of the adults) for 50-60 days. The egg hatchs in December and the chicks covered in soft grey down. The chicks are raised by both parents for 80 days until they are ready to leave the nest in late March, early April. The chicks are fed by the parents on regurgitated krill and fish brought back from the sea at night by the parents.

When the chicks have reached a suitable weight and have all their flight feathers, they will leave the colony at night and fly to the ocean. From this moment they are totally independent of their parents. It is thought that shortly after this time the fledglings will leave the country and fly to Australian coastal waters and return to NZ each spring. When the chicks, now young adults are about 4—6 years old, they return to Kaikoura colonies to breed and start the process for the next generation.



Hutton's Shearwater rafted up off Kaikoura coast

Hutton's Shearwater line their nest with tussocks, sticks, and feathers

Hutton's Shearwater

Helping Hutton's Shearwater

Habitat loss and predation by introduced mammals is the main threat to the remaining Hutton's shearwater populations. Deer, goats and chamois are known to trample nesting burrows, stoats and cats will eat young birds and eggs, and pigs would be a major predatory threat if they reached the breeding colonies.

Hutton's shearwater feed on fish and krill, so are vulnerable to becoming tangled in set nets and drowning. Fishermen can help protect the seabirds by monitoring nets closely.

Young Hutton's shearwater can become disoriented by bright lights, when they leave their inland colonies and instinctively fly out to sea. Some crash to the ground, often on roads, especially in wet or misty weather.

In 2006, 140 young birds were recovered from Kaikoura streets over a two night period. Almost all of these were later successfully released from the new colony on Kaikoura Peninsula.

Kaikoura residents and others can help reduce the loss of young birds during their first flight in March and April by:

- Turning off any non-essential outside lights or using downlights which direct light beams to the ground.
- Driving carefully to avoid running over any Hutton's shearwater that have landed on the road.
- At night, keeping dogs and cats indoors or tied up to prevent them attacking Hutton's shearwater.
- If you come across a disorientated Hutton's shearwater, release it at the beach above the wave action area or take it to the DOC office in Kaikoura.



Volunteers helping to establish the new Hutton's Shearwater colony.

Where Do Hutton's Shearwater Live?

Hutton's shearwater is an endangered seabird endemic to Kaikoura. That means they don't breed anywhere else in the world or New Zealand for that matter, just Kaikoura. The only place in the world that this species breeds (has its chicks) naturally is in steep and rugged locations high up in the Seaward Kaikoura mountains, at elevations between 1200 to 1800 metres.

In 1964, Ornithologist Geoff Harrow, discovered eight breeding colonies in the Seaward Kaikoura Ranges/ Ka Whata Tu o Rakihouia. Only two of the original eight colonies now remain. The others disappeared, probably due to wild pig predation. One colony is in the Uerau Nature Reserve in the Kowhai River catchments, the other is on private land at the head of the Puhi Puhi Valley.

The Peninsula Colony

The Department of Conservation started establishing a new colony of Hutton's Shearwater on the Kaikoura Peninsula in 2005. Nearly 300 shearwater chicks were brought down from the mountain colonies to new homes at the Kaikoura Peninsula over a five year period. The first record of a bird returning to the peninsula colony was in December 2008. More birds returned in summer 2009-10. In November 2010 the first egg was laid by one of the original translocated chicks in one of the artificial nest boxes.

Winter homes

Hutton's shearwater spend the winter in Australian waters, returning each August to the Kaikoura Ranges/ Ka Whata Tu o Rakihouia to breed. During spring and summer, large flocks can often be spotted just offshore from the Kaikoura coastline flying low over the sea or rafted up in large groups on the water where they feed on fish and krill.



Natural breeding ground of the Hutton's Shearwater high in the Seaward Kaikoura Ranges/ Ka Whata tu o Rakihauia



Artificial nesting box on the Kaikoura Peninsula colony

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Establishing A Hutton's Shearwater Colony

Habitat loss and predation by introduced mammals is the main threat to remaining Hutton's shearwater populations. Deer, goats and chamois are known to trample nesting burrows, stoats and cats will eat young birds and eggs, and pigs would be a major predatory threat if they reached the breeding colonies.

Both remaining breeding colonies in the Kaikoura Ranges are confined to a small area, making birds in the burrows extremely vulnerable to events such as landslides or predation which could lead to extinction.

To help secure the long-term survival of Hutton's shearwater, a third colony is being established on a Kaikoura Peninsula site.

The first trial transfer of 10 Hutton's shearwater chicks was made in 2005, with 86 more transferred in 2006. Another 95 chicks were moved to the peninsula in 2007 and 100 chicks in 2008.

For two to three weeks the chicks were fed daily a mixture of warm sardines and water, until they reached optimal size and flew away.

Feeding the young chicks on the Peninsula encourages them to identify the area as their breeding ground, hopefully programming them to return here from Australian coastal waters two to five years after they leave.

Te Rūnanga o Kaikoura's involvement with the tītī or Hutton's shearwater recovery programme highlights their role as kaitiaki (guardians) of this bird, it is recognised by Ngāi Tahu as a taonga (treasured) species.



New Hutton's Shearwater colony on Kaikoura Peninsula



Hand feeding Hutton's Shearwater chicks at new colony

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Seabird Adaptations

Students will consider the adaptations that seabirds have to help them survive under some very extreme conditions.

Mate •	erials Needed Southern Seabird So- lutions Fact sheets 3 and 4	Discussion What do all birds have in common? What are some of the ways birds can be different? How are seabirds different to forest birds to wetland birds to city birds?	
•	Seabird adaptations worksheet	The adaptations which help birds survive in different environmen are key.	
•	Craft paper and art supplies	How would a falcon do swimming out at sea? Would a albatross find the food it needs in a forest?	

Discuss adaptations:

Feet/claws-

Predator birds have sharp talons for grasping prey.

Ducks have webbed feet to help with swimming.

Tomtits, fantails have small agile feet to help them grasp branches.

Chickens have feet designed for scratching in the dirt looking for insects.

Beaks

Predator birds have strong beaks for tearing flesh of their prey. Kiwi have long probing bill for finding worms in the soil. Tui have curved bill and tongues for getting nectar. Fantails have short bill for catching insects.

Other adaptations:

Good camouflage feather colours (fantail, kiwi) Great eyesight (falcons, morepork) Songs—for calling to each other/giving warnings (falcons, gulls)

Doing the activity:

Part 1

What makes a seabird a seabird?

What special adaptations do seabirds have? Review the Seabird ecology fact sheets (created by Southern Seabird Solutions) Have students complete the Seabirds Adaptation worksheet.

Discuss why these adaptations are helpful at sea.

Part 2

Adaptation Creations

Have students create their own Sea Bird using any combination of adaptations they like. Draw or write about their new bird.

Be sure students include:

The name of their bird and what it looks like. Where it lives—is it there full time/ part time? How its adaptations help it feed. Does it travel far? How does it get around? How long it lives? Where does it breed? Choose a mate? What the main threats to the new bird?



Seabird Adaptations

Seabirds including the Hutton's Shearwater are adapted for life at sea. They have adapted to live under some very extreme conditions.

Use the Seabird Ecology Fact Sheets to see how many special adaptations you can find that help seabirds survive.

Adapted Body Part	What adaptation is used for
Salt glands and tube-noses	To get ríd of the extra salt the get from drínkíng salt water.

Teacher Key

Nasal salt gland Nostril with salt secretions

Seabird Adaptations

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Adapted Body Part	What adaptation is used for
Salt glands and tube-noses	To get ríd of the extra salt the get from drínkíng salt water.
Oil glands	Oil glands make the feathers waterproof and therefore makes the bird buoyant and helps them to sleep on the sea.
Legs and Feet	Short legs are used like oars and their feet are like paddles that help them swim and dive
Tube Noses	Help them smell food from many kilometers away.
Beaks	Sharp point and sides to catch fish and cut into bite size portions.
Wings	Seabirds have long wings in relation to their body size. This makes flight easier and more efficient.
Streamlined bodies	Help them fly more efficiently and dive to great depth.





Seabird ecology

What makes a seabird a seabird?

"Ka pā te muri, ka tangi te toroa, ki tõna kāinga i waho i te moana" When the north wind blows, the albatross weeps for its home far out on the ocean - Ngāi Tahu, Whakataukī

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 titi/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





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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.







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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?

Pid 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







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



Southern Seabird Solutions Fact Sheet



Page 2

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







Page 3

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 täkapu/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

Games can dire at speets

S con to 145km perhout

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

Heres Photograph Competition Courtesy Southern Seabird Solutions Seabirds follow fishing vessel, those

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.

and of search y and of y and on the people unoin and the people unoin a 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.

The Big OE

Students will chart the annual migration of Hutton's shearwater to the Australian Coastal waters.

Materials

Hutton's Shearwater sheet

Coloured pencils/pens

Background Discussion:

Each autumn the entire population of Hutton's shearwaters leaves New Annual OE Map work- Zealand waters but until very recently we did not know for sure where they went or how they got there or how long they were gone.

> Using tiny geo-locators on the leg bands on the Hutton's shearwaters, researchers have been able to track exactly where the shearwater go each year.

Researchers now know what the departing Hutton's Shearwater leave New Zealand waters in March/April and head for the Australian coastal

water and don't return until the following spring to meet up with partners and beginning the breeding process again.

Interestingly Hutton's shearwater don't all go to the same place. Most birds flew south around Australia to overwinter in the Timor Sea. These birds then returned to New Zealand the same way. However a small number of birds took a different route, with the birds going north through Torres Strait to get to the same wintering grounds in the Timor Sea. These birds then followed the main group home south, around the bottom of Australia.

Have students plot two of known routes taken by the Hutton's shearwater during their annual OE. They spend the winter in Australian coastal waters.



Each year the Hutton's shearwater take a little OE (overseas experience) or as it is more correct to say, each year the Hutton's Shearwater migrate to Australia. After all they have just spent the previous 8 months (between October and March) digging out a burrow, incubating an egg, feeding and caring for a growing chick . So by April they are ready to head out for the warm, fish rich waters of Western Australia.

Not very much is known about the Hutton's Shearwater annual migration but researchers using tiny geo-locaters are starting to give us a pretty good picture. The research is showing that the Hutton's shearwater generally travel along two basic routes over the 5—6 months.

Map The Hutton's Shearwater Migration

On the map above plot two of the more typical journey routes. Include the month at each mapping point connect, the points as you go and use arrows to show the direction they are traveling. Use different colours pens to show the Hutton's Shearwater Migration Route.

The journey begins in Kaikoura. Start by locating Kaikoura on your map. NOTE: When you connect your mapping points, the Huttons's Shearwater travel at sea and along the coast, not over land.

Route 1		Route 2	
April	F3 Z1	April	F3 Z1
May	D3 Z2	May	D7 X3
June	A2 X5	June	C4 V3
July	A6 W5	July	A5 W3
August	A2 X3	August	A2 X3
September	C6 Z 2	September	C5 Z2
October	F3 Z3	October	F3 Z3

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May	D3 Z2	May	D7 X3	
June	A2 X5	June	CA V3	
July	A6 W5	tale	AS W3	
August	AZ X3	August	AZ X3	
September	C6 Z 2	September	C5 Z2	
October	F3 Z3	October	F3 Z3	

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Hutton's Shearwater Fact Finder

Test your Hutton's Shearwater Knowledge (check the Hutton's shearwater information cards if you need a reminder)

- 1 What is the Hutton's Shearwater's Latin /scientific name?
- 2 Where do they make their breeding burrows?
- 3 How many eggs do a pair of Hutton's shearwater lay each season?
- 4 What is a Hutton's shearwater nest made from?
- 5. How long are Hutton's shearwater eggs incubated for?
- 6. When do Hutton's shearwater chicks leave the nest?
- 7. Where do Hutton's shearwater fly to for the winter?
- 8. Which introduced mammals are a threat to the Hutton's shearwater?
- 9. How can people in Kaikoura help prevent Hutton's shearwater from coming to harm at night if they crash into town? (Hint: there are at least 4 provided in the information cards).
- 10. Where is the new colony of Hutton's shearwater being established?
- 11. What were Hutton's shearwater chicks fed when they got transferred to the new colony?
- 12. What is a kaitiaki?
- 13. What is a taonga species?
- 14. List 3 interesting facts about Hutton's shearwater?
- 15. Are Hutton's shearwater special to Kaikoura?

Hutton's Shearwater Fact Finder

Test your Hutton's Shearwater Knowledge (check the Hutton's shearwater information cards if you need a reminder)

1 What is the Hutton's Shearwater's Latin/scientific name?

Puffinus huttoní

2 Where do they make their breeding burrows?

High up above the tree line in Seaward Kaikoura Mountains/ Ka Whata Tu o Rakihouia

3 How many eggs do a pair of Hutton's shearwater lay each season?

1 egg per paír

4 What is a Hutton's shearwater nest made from?

Tussock grass, sticks and lined with feathers

5. How long are Hutton's shearwater eggs incubated for?

50 -60 days

6. When do Hutton's shearwater chicks leave the nest?

Late March, early April

7. Where do Hutton's shearwater fly to for the winter?

Australían coastal waters

8. Which introduced mammals are a threat to the Hutton's shearwater?

Deer, chamois, goats, stoats, cats and pigs.

9. How can people in Kaikoura help prevent Hutton's shearwater from coming to harm at night if they crash into town?

Turning off any non-essential outside lights or using downlights which direct light beams to the ground.

Dríving carefully to avoid running over any Hutton's shearwater that have landed on the road. At night, keeping dogs and cats indoors or tied up to prevent them attacking Hutton's shearwater.

If you come across a disorientated Hutton's shearwater, release it at the beach above the wave action area.

10. Where is the new colony of Hutton's shearwater being established?

The Kaikoura Peninsula

11. What were Hutton's shearwater chicks fed when they got transferred to the new colony? A mixture of sardines and warm water.

12. What is a kaitiaki?

A guardían

13. What is a taonga species?

A species that is treasured

14. List 3 interesting facts about Hutton's shearwater?

Answers will vary.

15. Are Hutton's shearwater special to Kaikoura?

Yes endemic to the area—only place they breed.

Additional Activities

Make A Board game

Have students create a Hutton's Shearwater board game where the Hutton's Shearwater will have to travel from its mountain colony as a young fledging, travel to Australia and back to have young of its own. The Hutton's Shearwater will face challenges on his journey to Australia and back, but fortunately there are lots of people out there helping them too.

Newsletter Report

Have students read one of the Hutton's Shearwater Charitable Trust newsletters (available from their website www.huttonsshearwater.org) and choose an article to report back on.

Post It

Spread the word about Hutton's Shearwater. Use the Helping Hutton's Shearwater Information Card 3 to create brochures and posters to post around the school and in the community.

Sharing a Name

Hutton's shearwater are a very rare species of the larger shearwater family. Have students research and report back on the different types of shearwater found in New Zealand.

What makes a shearwater a shearwater?

Why are some shearwater so common and the Hutton's shearwater so rare?

Get involved

Visit the Hutton's Shearwater Trust webpage www.huttonsshearwater.org. to find out more ways you can get involved with helping to protect the Hutton's shearwater.

Learn More

Visit Southern Seabird Solutions on http://www.southernseabirds.org/ or the Department of Conservation www.doc.govt.nz to find out more about New Zealand seabirds.

http://www.arkive.org/huttons-shearwater.