

# The South Island Hector's Dolphin/Upokohue

A LEVEL 3 LEARNING PROGRAMME - **TEACHER BOOK**



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# CONTENTS

## HOW THE PROGRAMME WORKS

- Part 1 & Part 2 2
- How the programme links to the New Zealand Curriculum 3

## PART 1: GETTING TO KNOW THE HECTOR'S DOLPHIN/UPOKOHUE

- New Zealand's Marine Environment 4**
- New Zealand's Marine Mammals 5**
- The Hector's Dolphin - A quick introduction 5**
  - Two of a kind - South Island Hector's Dolphin/Upokohue and Maui's Dolphin 6
  - Danger, Danger - a threatened species 6
  - Oh so special! 6
- The South Island Hector's Dolphin/Upokohue 7**
  - Quick fire facts 7
  - It's all in the breeding 7
  - Getting along - relationships and behaviour 7
  - Feeding time 8
  - Predators and threats 8
  - Protecting the Hector's Dolphin/Upokohue 9
  - And what can YOU do? 10

## PART 2: THE LEARNING PROGRAMME

- Programme aims & Inquiry Learning 12**
- Structure of the learning programme 13**
- What you need to do prior to teaching the programme 13**

### Section A: Immerse yourself

- Session 1 - 3: Tuning in - Exploring students' prior knowledge, understanding and attitudes 14**
  - **Session 1:** Tuning in - Getting to know the marine environment 14
  - **Session 2:** Tuning in - New Zealand's marine mammals 15
  - **Session 3:** Tuning in - The Hector's Dolphin/Upokohue 16
- Sessions 4 - 7: The South Island Hector's dolphin**
  - **Session 4:** Delving deeper - Banks Peninsula/Te Pātaka o Rākaihautū and the South Island Hector's Dolphin/Upokohue 18
  - **Session 5:** Delving deeper - An appreciation of the South Island Hector's Dolphin/Upokohue 19
  - **Session 6:** Delving Deeper - An appreciation of the South Island Hector's Dolphin/Upokohue 20
  - **Session 7:** Te Whakaraupō/Lyttelton Harbour Hector's Dolphin/Upokohue Cruise 22

### Section B: Investigation: Hector's Dolphin/Upokohue

- **Session 8 & 9:** Reflect, evaluate, act: A marine mammal under threat 23

### Section C: Shout it from the shores!

- **Session 10 & beyond:** What can we do to fix it - Taking action for the South Island Hector's Dolphin/Upokohue 26

## BLACK MASTERS & APPENDICES 28

## STRUCTURE OF THIS BOOK

The teacher support book is divided into two parts:

- Part 1** Getting to know the Hector's Dolphin/Upokohue: Useful background information on the New Zealand marine environment; an overview of the Hector's Dolphins/Upokohue, with a specific focus on the South Island/Te Waipounamu Hector's dolphin - description, diet, threats and habitat including an in-depth look at Banks Peninsula/Te Pātaka o Rākaihautū as a local habitat of the South Island/Te Waipounamu Hector's Dolphin/Upokohue. It also explores ideas about what can be done to help protect the Hector's Dolphin/Upokohue
- Part 2** The Learning Programme: The programme is divided into four sections. Each section is supported by in-class 'sessions', with relevant activities and information included in the student workbook to support learning.

## The New Zealand Curriculum

The New Zealand Curriculum gives strong support to inquiry-based learning and to involving students in sustainability issues. The principles and values on which the curriculum is based include future focus, innovation, inquiry and curiosity, as well as ecological sustainability and community participation.

Four of the five key competencies align well with the aims and methods of education for sustainability:

**Thinking** "challenge the basis of assumptions and perceptions".

**Managing Self** "have strategies for meeting challenges".

**Relating to Others**  
"new approaches, ideas and ways of thinking".

**Participating & Contributing**  
"contributing to the quality and sustainability of social, cultural, physical and economic environments"



# How the programme links to the New Zealand Curriculum

## CURRICULUM LEVEL 3

### FOCUS: South Island Hector's Dolphin/Upokohue

#### BIG IDEAS

That everything is interconnected; that Hector's Dolphins/Upokohue are special and endemic to New Zealand; they are endangered by human activities impacting on the life and habitat of the dolphin.

#### MAJOR KEY COMPETENCY FOCUS IN THIS UNIT

**Thinking**  
**Managing self**

**Participating and contributing**  
**Relating to others**

#### VALUES

**Innovation, inquiry and curiosity:** the unit is designed to encourage learners as innovative thinkers and to critically analyse questions related to the Hector's Dolphin/Upokohue and its preservation.

**Community and participation:** the unit encourages learners to work with individuals and groups beyond their school gates.

**Ecological sustainability:** is at the heart of this unit.

#### LEARNING AREA LINKS

##### LEVEL 3 SCIENCE

###### Nature of Science

*Students will:*

###### Understanding about science

- Appreciate that science is a way of explaining the world and that science knowledge changes over time.
- Identify ways in which scientists work together & provide evidence to support their ideas.

###### Participating and contributing

- Use their growing science knowledge when considering issues of concern to them.
- Explore various aspects of an issue and make decisions about possible actions.

###### Living World

###### Ecology

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

###### Evolution

- Begin to group plants, animals, and other living things into science-based classifications.
- Explore how the groups of living things we have in the world have changed over time and appreciate that some living things in New Zealand are quite different from other living things in other areas of the world.

##### LEVEL 3 SOCIAL STUDIES

*Students will gain knowledge, skills and experience to:*

- Understand how cultural practices vary but reflect similar purposes.
- Understand how people make decisions about access to and use of resources.

##### LEVEL 3 ENGLISH

###### Speaking, writing, and presenting processes and strategies

*Students will:*

- Integrate sources of information, processes, and strategies with developing confidence to identify, form and express ideas.

# Part 1: Getting to know the Hector's Dolphin/Upokohue

When getting to know someone, it is helpful to know where they come from. It is no different when getting to know the Hector's Dolphin/Upokohue. Having an understanding of New Zealand's marine environment and the diverse habitats and species within it allows us to truly appreciate the uniqueness of this wonderful marine mammal.

## New Zealand's marine environment

New Zealand has a very large marine area compared with our land size (Figure 1<sup>1</sup>). New Zealand comprises two main islands and more than 700 smaller islands and islets. It has one of the longest coastlines and one of the largest marine areas in the world, compared with its land area. New Zealand's rich and complex marine environment is subtropical to subantarctic. This means New Zealand has a rich diversity of marine habitats, with over 15,000 known species. Scientists estimate that there may be as many as 65,000 marine species in New Zealand waters. Our isolation means that many of these species are not found anywhere else in the world.

### Why so many and varied?

Our main islands lie on the boundary between two tectonic plates - huge moving segments of Earth's crust - and in the pathway of warm subtropical and cooler, subantarctic surface water masses flowing from the west. The meeting point of these warm and cold water masses, known as the Subtropical Front, creates ideal conditions for plankton and the fish species that feed on them. The Subtropical Front flows from the west around the southern waters off the far south of the South Island/Te Waipounamu, up the lower west coast, and out across the Chatham Rise - one of the most productive areas for fishing in New Zealand.

This complex geology and mix of sea temperatures and ocean currents mean our marine area has many diverse marine habitats, from saltmarsh and mangrove forests, to rocky coastal reefs, to deep sea trenches, canyons, undersea volcanoes, and seamounts.

Scientists estimate that as much as 80% of New Zealand's indigenous biodiversity may be found in the sea. Yet less than 1% of our marine environment has been surveyed. On average, seven new marine species are identified every fortnight.

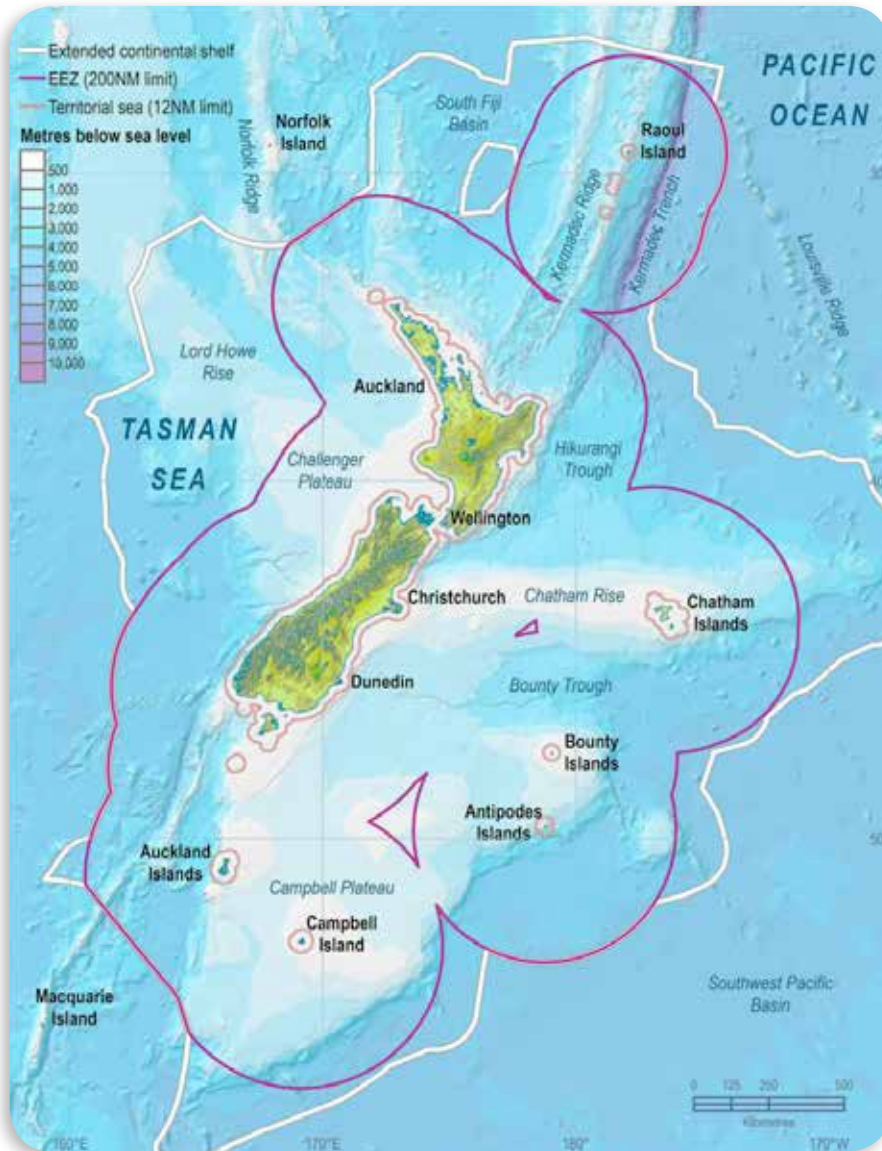


Figure 1: New Zealand's Marine Environment

<sup>1</sup>Source: MFE - New Zealand's Environmental Reporting Series - Our Marine Environment 2016.

## New Zealand's marine mammals

Such diverse marine habitats attract thousands of marine species including marine mammals. New Zealand has a range of marine mammal species and subspecies, including whales, dolphins, seals, and sea lions. Many of these species are endemic to New Zealand. They are apex species (near the top of the food chain) and can thrive only if their ecosystems are healthy. A decreasing population can indicate that the ecosystem is degrading. Of our 29 resident indigenous marine mammal species and subspecies, in 2013 eight (28 percent) were threatened with extinction, and nine (31 percent) were not threatened. There is inadequate data to assess the conservation status of 12 indigenous species and subspecies (the remaining 41 percent)<sup>2</sup>.

Marine mammals play significant roles in creation, migration, and settlement traditions for **Ngāi Tahu**. Whales and dolphins also feature as kaitiaki/guardians or taniwha - powerful water spirit - in local legends linking ancestors to the coastal environment of the South Island/Te Waipounamu. As kaitiaki, marine mammals were called upon to assist and protect voyagers during storms at sea. The karakia (prayer) used to invoke such help contributed to the rich body of traditional beliefs that reflect the close relationship with the sea and its inhabitants.

Associated customary practices and vast knowledge of the coastal environment are handed down from generation to generation, becoming part of the traditions that continue to shape the identity of Ngāi Tahu.

These traditions bind Ngāi Tahu and marine mammals in a relationship that acknowledges the mauri - life force - shared by all the elements of the natural world, living and inanimate. Ngāi Tahu therefore endorses and supports the special protective status given to marine mammals in the waters of Banks Peninsula/Te Pātaka o Rākaihautū.

## The Hector's dolphin/Upokohue - A quick introduction

The Hector's Dolphin/Upokohue is New Zealand's only endemic or native dolphin. Although mainly found in our inshore waters, up to half of the population has also been spotted in unprotected waters beyond four nautical miles offshore.

The Hector's Dolphin/Upokohue is the most well-known of the four dolphins in the genus Cephalorhynchus. The other three dolphins are the Commerson's dolphin, the Chilean dolphin and the Heaviside's dolphin. They all have similar physical features - small, generally playful, blunt-nosed dolphins - but they are each found in distinct geographical locations.

The dolphin was named after Sir James Hector (1834 to 1907). Sir James was the curator of the Colonial Museum in Wellington, better known now as 'Te Papa'. He examined the first 'Hector's' Dolphin/Upokohue specimen and become one of the most influential New Zealand scientist of his time.

The Hector's Dolphin/Upokohue are taonga species to Ngāi Tahu. Taonga species are native birds, plants and animals of special cultural significance and importance to Ngāi Tahu. The Crown's settlement with Ngāi Tahu (Ngāi Tahu Claims Settlement Act 1998) included recognition of the special traditional relationship Ngāi Tahu have with taonga species. Ngāi Tahu participates in the management of those species in many ways, including representation on species recovery groups.

<sup>2</sup>Source: Stats NZ: Environmental indicators: Conservation status of marine mammals (Cited: September 2017)

## MARINE MAMMALS

Marine mammals are aquatic mammals that rely on the ocean and other marine ecosystems for their existence.

To be classified as a mammal an animal must possess all five of these characteristics;

*they have lungs and breathe air*

*they are warm blooded and maintain a constant body temperature*

*most bear live young*

*they produce milk and nurse their young*

*they have hair at some point in their lives.*

### NGĀI TAHU TAKIWÄ

*Ngāi Tahu takiwä (ancestral land) is defined by the Te Rünanga Ngāi Tahu Act 1996. It covers most of the South Island/Te Wai Pounamu - excluding a northern segment - and the islands to the south including Stewart Island/ Rakiura and other islands.*

*(Reference: Ngāi Tahu Claims Settlement Act 1998; Section 287, Schedule 97.)*





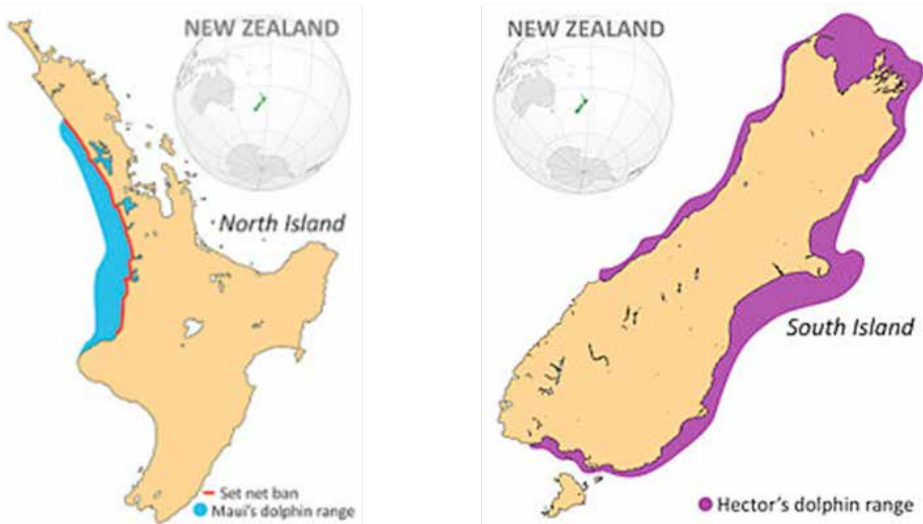


Figure 2: Hector's dolphin/Upokohue - Sub species location

### Two of a kind

The Hector's Dolphin/Upokohue are among the world's smallest marine dolphins. There are **two sub-species** of Hector's dolphins/Upokohue: the **South Island Hector's Dolphin/Upokohue** which is found around the South Island of New Zealand; and the **Māui's Dolphin** which is found off the west coast of the North Island.

This inquiry based education resource will focus on the **South Island Hector's Dolphin/Upokohue**. If you are interested in learning more about the Māui's Dolphin please refer to the WWF Māui's Dolphin education resource: [www.wwf.org.nz/what\\_we\\_do/education/](http://www.wwf.org.nz/what_we_do/education/)

### Danger, danger!

Both the South Island Hector's and Māui Dolphins are threatened. In the 1970s, there was an approximate total of 30,000 Hector's dolphin/Upokohue. The last 40 years have seen a rapid decline in their populations. The Department of Conservation/Te Papa Atawhai and the International Union for the Conservation of Nature (IUCN) classify both sub-species as threatened.

**Māui's Dolphins** are '*nationally critical*'. The latest population (2015) estimate for Maui Dolphin puts their population at only 50 dolphins over the age of one.

The **South Island Hector's Dolphins/Upokohue** are listed as '*nationally endangered*'. In 2016, a study by Cawthron Institute estimated between 12,000 - 18,500 living in and around our South Island shores. This is up from the original estimate of only 7000 but they are still constantly under threat.

### Oh, so special!

There are many special things about the Hector's Dolphin/Upokohue. For instance, the South Island Hector's and Māui's Dolphins are the only dolphins in the world with a rounded dorsal fin. They also have distinctive black markings on their fins, tails, flippers and faces. While common dolphins grow to about 2.6m in length, the Hector's and Māui's Dolphins typically reach between a mere 1.2 - 1.5 meters. They are so small you could fit them into a bathtub!

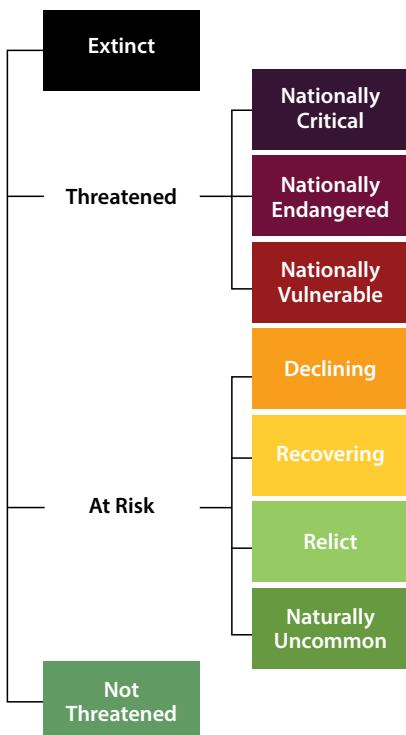


Figure 3: New Zealand Threat Classification System (NZTCS) Source: DOC.



# The South Island Hector's Dolphin/Upokohue

## Quick Fire Facts

The South Island Hector's Dolphin/Upokohue is the original Hector's dolphin species. The Māui's Dolphin is a sub-species of the South Island Hector's Dolphin/Upokohue.

## Did you know?

- The Hector's Dolphin/Upokohue are taonga species to Ngāi Tahu.
- They grow no more than 1.5 metres in length with males or 'Bulls' being the smaller and lighter dolphin.
- The adult dolphin weigh between 40 and 60 kg.
- Each pod consists of 2 - 12 dolphins.
- Most of the dolphin's body is a light grey colour with the flippers, flukes and dorsal fin being a dark grey to black in colour. The stomach and throat areas are milky white.
- They are found along the entire South Island coastline (except Fiordland), to a distance of up to 30km offshore.
- Given the chance, they can live to a maximum of 20 years of age.
- Populations are concentrated between Haast and Farewell Spit in the west, around Banks Peninsula in the east, and Te Waewae Bay and Porpoise Bay/ Te Whanangā Aihe in the south.

## It's all in the breeding

The South Island Hector's Dolphin/Upokohue matures at about 7-9 years old. They mate in late spring and the calves are born about a year later. The female dolphin or 'cow' usually has one calf every 1 to 3 years. This is considered to be a long time between each calf and therefore makes population increase a very slow process. Most females only have four or five calves in a lifetime. In other words, a population of 100 New Zealand dolphins can grow by 2 individuals at most in any one year. That makes them very vulnerable to human impact.

Calving usually occurs between November and mid-February, and calves stay with their mothers for up to two years. The calves are 50 - 60 centimetres at birth and weigh about 9 kilograms. They stay close to their mothers who provide them with milk and protection until they are old enough to fend for themselves; usually up to about two years of age.

## Getting along – relationships and behaviour

The South Island Hector's Dolphin/ Upokohue have very large brains and this is reflected in their complex behaviour and social system. As is the case with other dolphins, they live in social groups known as pods. The pods consist of between 2 and 12 other dolphins with several males or several females and their calves. The dolphins create very strong bonds within their smaller, 'family' pod. Their social system is usually described as 'fission - fusion'. In other words, if a group of 4 and a group of 5 meet, they don't necessarily split up into their original groups again but may go onto form new and different groups when they go their separate ways.

Like many groups living together, there are times where they become hostile towards each other. They can bite or blow bubbles and splash their tails. Although this can be a sign of play it can also serve as a warning to other dolphins to keep their distance.

The smaller 'family' pods sometimes join other larger groups of 20 - 30, and at times form pods as large 100 or so dolphins.

The South Island Hector's Dolphin/Upokohue tend to stay in the same area - sometimes for life. Here, they spend their days swimming along the coastline, surfacing to breathe, diving to find food and playing.

*Ka tiro ake ki te Poho o Tamatea  
Pokai Whenua*

*Heke whakararo nga wai Omaru  
Ki nga wai karikari o whakaraupō  
moana.*

*Ko Takitimu, Ko Makawhiu,  
ko Uruao ngā waka*

*Ko Kāi Tahu te Iwi*

*Ko Te Rāpaki o Te Rakiwhakaputa  
te marae*

*Ko Ngāti Wheke te Hapū ko wheke  
te whare.*

*Ora tonu mai ko te Pātaka  
ō Rākaihautū*

The natural habitat of the Upokohue sits within Te Pātaka-ō-Rākaihautū or otherwise known as Banks Peninsula and is part of the takiwā of Ngāti Wheke the local mana whenua who reside in Rāpaki and surrounding areas.

Rākaihautū is recognized as the first person to have set foot on Te pātaka and is said to have seen that there was so much food available in the area that he called it Te Pātaka o Rākaihautū (The great food storehouse of Rākaihautū).

For that reason you will find many different types of animals and trees in this area that only grow in Te Pātaka-ō-Rākaihautū which are said to have been the kaitiaki of this area.



## Kupu hou - New Words

Upokohue - Hector's Dolphin

Takiwā - Region

Rāpaki - Bay located near Lyttelton

Ngāti Wheke - Local hapū of Whakaraupo Harbour and surrounding areas.

Te Pātaka-ō-Rākaihautū - Banks Peninsula

Kaitiaki - Sacred Guardian



Hector's Dolphins/Upokohue are active animals, readily bow-riding and playing with seaweed. When leaping from the sea, individuals will often land on their side, creating a loud splash (their vertical and horizontal dives are much less noisy).

The South Island Hector's Dolphin/Upokohue are known to be slower at swimming than other species of dolphins. They can dive for a period of time up to 3 minutes before they have to surface for air. Clicking is frequently used by them for communication through echolocation. This is the only species of dolphin that won't use whistling sounds as a form of communication. Experts aren't sure why the Hector's dolphin/Upokohue doesn't engage in such a behaviour.

### **Feeding time**

Like other dolphins, Hector's/Upokohue use echolocation to find their food. They send out high frequency 'clicks' that bounce off surrounding objects and fish, giving the dolphins a detailed picture of their surroundings. When the sound strikes an object it bounces back and the dolphin can tell by listening what the object is - what kind of fish it is, how far away it is and how fast it is moving. This echolocation sonar is not used all the time, which may be one of the reasons why the dolphins get caught in nets.

Hector's Dolphins/Upokohue feed on fish and other sea creatures found in shallow water with a sandy bottom. They particularly like flounder, red cod, mackerel, crabs and squid. Dolphins use their teeth to bite the food but then they swallow it whole, without chewing. They swallow fish, head first, so that the spines of the fish won't catch in their throats.

Like other sea-dwelling mammals, the South Island Hector's dolphin/Upokohue can obtain water from their food. They produce it internally from the metabolic breakdown of food.

### **Predators and threats**

The South Island Hector's Dolphin/Upokohue was given a 'threatened species' status by the Department of Conservation/Te Papa Atawhai in December 1999. Although the estimated population of the South Island Hector's Dolphin/Upokohue 12,000 - 18,000, they are constantly under threat by predominately human activity although some sharks are known to prey on the Hector's Dolphin/Upokohue.

#### **All about us**

The Hector's Dolphin/Upokohue were once widely hunted for fishing bait. Thankfully, that is no longer allowed. However many human activities do pose incredible and constant threat to the wellbeing and survival of the South Island Hector's Dolphin/Upokohue.

The biggest threat to this endangered species is inshore fishing. Net fishing, in particular gill/set nets and trawl nets, poses a major threat to both the South Island Dolphin/Upokohue and Māui's Dolphin. Like all marine mammals they need to come to the surface regularly to breathe. If they become tangled in set nets, they will hold their breath until they suffocate. Even as late as 2006, between 110 and 150 NZ dolphins were killed in gill nets each year.

Because these dolphins frequent close inshore, often in bays and harbours, they are at risk of being injured by boats. Newborn dolphins are particularly vulnerable as they swim relatively slowly, close to the surface. Some have been killed by boat propellers when unwary boaties have run them over.

Stress created by boats is common for these dolphins. They tend to swim closer together when boats are around. It is possible doing so helps them to reduce some of that stress. Limiting boating in certain areas where they live can be helpful.

Both species of the Hector's Dolphin/Upokohue are at risk from other human-induced threats including mining, construction, coastal development, pollution, marine tourism, marine farming and climate change. Chemicals and other types of pollution continue to be common threats for them.

Dolphins and people have shared our coastal waters and bays for centuries. In recent years, there has been a worldwide increase in awareness of marine mammals and a greater desire to protect them.

# Protecting the Hector's Dolphin

Like many things, protecting the Hector's Dolphin/Upokohue isn't as simple as stopping the main threat and all will be well, as tempting as that may sound! Balancing the needs and wants of people and activities while recognising how that impacts on the needs of all marine species including the South Island Hector's Dolphin/Upokohue must be considered and acted upon. This is not only for the survival of the species but also to ensure the sustainability of our fishing industry and the enjoyment of the marine environment. Everything is interconnected. Take one thing away and nature's finely tuned ecological balance tips.

Marine mammals have a special place in New Zealand's natural and cultural heritage. Māori have a strong traditional relationship with whales, and many of the earliest European immigrants to New Zealand were whalers and sealers.

New Zealand is home to a great variety of marine mammals, with around 43 species of cetaceans (whales, dolphins and porpoises) and nine species of pinnipeds (seals).

## So where do we start?

### 1. LEGISLATION

New Zealand has been at the global forefront of marine mammal conservation and sustainable tourism. All marine mammals are fully protected in New Zealand waters under the Marine Mammals Protection Act 1978, which DOC administers.

The Marine Mammals Protection Regulations were introduced in 1992 to control marine mammal tourism activities and set-net controls were introduced to Canterbury in 2002 and in west coast North Island in 2003. In 2007, DOC, in a joint initiative with the Ministry of Fisheries developed a Draft Threat Management Plan.

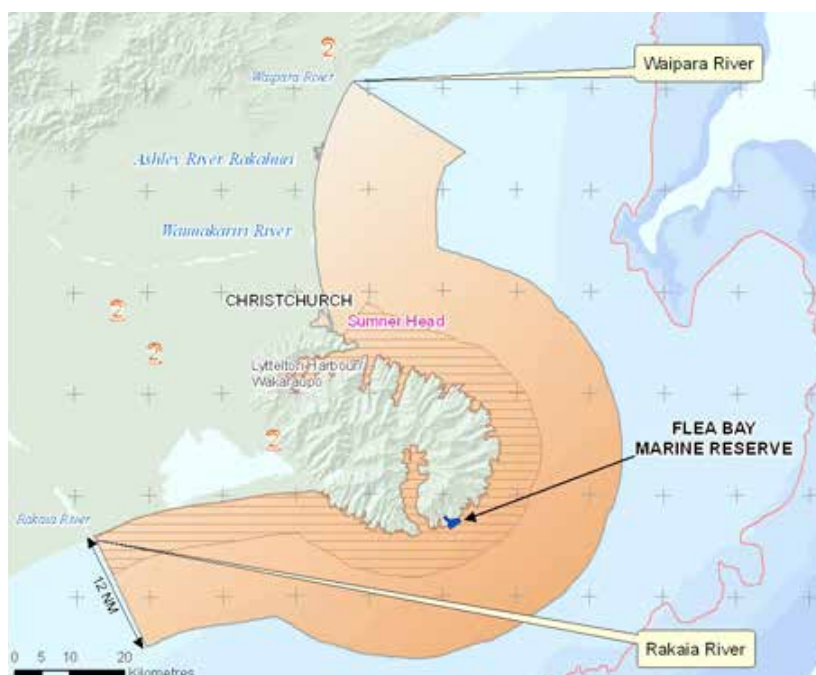
### 2. MARINE MAMMAL SANCTUARIES

Marine mammal sanctuaries are designed to protect marine mammals from harmful human impacts, particularly in vulnerable areas such as breeding grounds and on migratory routes. This has been done in various ways such as restricting commercial fishing and certain methods of recreational fishing. DOC is responsible for the implementation, management and monitoring of all marine mammal sanctuaries.

New Zealand's has eight Marine Mammal sanctuaries<sup>3</sup>: Auckland Islands, Banks Peninsula/Te Pātaka o Rākaihautū, Catlins Coast, Clifford and Cloudy Bay, Te Waewae Bay and the West Coast North Island.

There are also two sanctuaries administered under the Kaikōura (Te Tai o Marokura) Marine Management Act 2014:

- Te Rohe o Te Whānau Puha Whale Sanctuary.
- Ōhau New Zealand Fur Seal Sanctuary.



## **Banks Peninsula/Te Pātaka o Rākaihautū Marine Mammal Sanctuary**

*In 1988 The Department of Conservation/Te Papa Atawhai created the first marine sanctuary in New Zealand. The Banks Peninsula/Te Pātaka o Rākaihautū Marine Mammal Sanctuary was specifically created to help the South Island Hector's Dolphin/Upokohue. The goal of this effort was to help reduce the risk of Hector's Dolphins getting tangled up in commercial fishing nets. It now also includes the Akaroa and Pōhatu marine reserves.*

<sup>3</sup>Source: Department of Conservation Cited: <http://www.doc.govt.nz/nature/habitats/marine/other-marine-protection/>



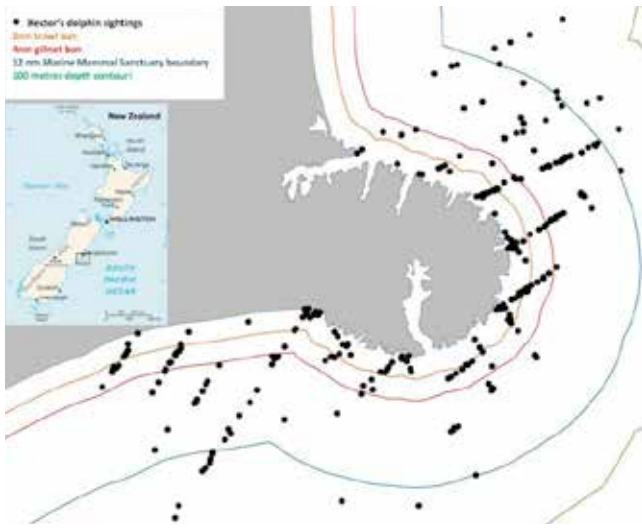


Figure 4: Hecator's dolphin/Upokohue sightings on Banks Peninsula/ Te Pātaka o Rākaihautū. Surveillance was carried out by Earthrace Conservation 2013.



## And what can YOU do?

Ensuring both sub species of the Hecator's Dolphin/ Upokohue have a chance of recovery and survival, it cannot be left up to 'others', to laws, sanctuaries with scientific resource guiding the way. We all have a responsibility and role to contribute towards their recovery. And we can make a difference!

- **Report any set nets or trawlers** operating within an area closed to these types of fishing by phoning the Ministry of Fisheries (MFish) hotline: 0800 4 POACHER - 0800 476 224.
- **Set net fishing areas** - In areas where set net fishing is allowed, be careful where and how you use set nets. Stay with your net all the time and check it regularly. Remember it only takes a few minutes to drown a dolphin. If dolphins are around, take your net out of the water immediately, and encourage others to do the same. Better yet, stop using set nets and only buy sustainable caught fish. Contact Forest & Bird for a Best Fish Guide.
- **If you see a Hecator's Dolphin/Upokohue**, Report sightings - If you see a Hecator's Dolphin/Upokohue being harassed, stranded or severely injured or dead contact 0800 DOC HOT (0800 362 468). Also, if you or a member of your family or friends catch a Hecator's Dolphin/Upokohue in a fishing net, you also need to call 0800 DOC HOT (0800 362 468).
- **Be boat smart** around dolphins. Use a 'no wake' boat speed within 300 metres of them. New Zealand law makes it illegal to harass any marine mammal. If you see a dolphin being harassed, report it straight away to DOC on 0800 DOC HOT - 0800 362 468 or call Project Jonah 0800 4 WHALE - 0800 4 94253.
- **Fishing gear and other rubbish** thrown overboard poses a serious risk to Maui's Dolphins and other marine life. Make sure you take any rubbish back to shore and please retrieve any abandoned 'ghost' nets that you come across
- Make sure your rubbish stays out of storm water drains. Secure lids on bins and pick up any rubbish you see in the gutter or on the beach. Organise beach clean ups or join us for a scheduled event.

However, even Marine Mammal Sanctuaries don't fully protect marine mammals from threats. An example of this is highlighted around Banks Peninsula/Te Pātaka o Rākaihautū (Figure 4<sup>4</sup>) on the east coast of the South Island/Te Waipounamu. The South Island Hecator's Dolphin/Upokohue range out to 20 nautical miles offshore but the protection measures only extend to 4 nautical miles (one nautical mile is 1.85 kilometres). Therefore, it is believed extending the existing trawl ban out to 100m water depth, or 7 nautical miles at a minimum is required to protect the species in this part of its range.

### 3. RESEARCH AND DEVELOPMENT

Research and scientific studies continue to increase our knowledge about each sub-species' ecology, conservation status, life history, and threats. This helps us understand the best way to protect the Hecator's Dolphin/Upokohue. It also assists in guiding and improving management practices in an attempt to ensure their survival into the future. However, funding for such studies can be hard to come by. The more we know about the animals, the easier it will be to protect them.

### 4. OTHER PROTECTION MEASURES AND CONSIDERATION COULD INCLUDE:

- Implementing a complete gillnet ban in waters up to 100m deep around the New Zealand coast.
- Strictly enforcing the current set net ban by having enough staff available.
- Putting in place 100% observer coverage on trawlers throughout the dolphins' range. This means that any impact fishing has on the dolphins will be reported, rather than relying on voluntary reporting, which isn't always accurate.
- Implementing a plan for dolphin population recovery. Such a plan (similar to those for kiwi, kakapo and other critically endangered species) will set out a comprehensive series of measures to ensure the species recovers to a viable population.

<sup>4</sup>Source: Whale and Dolphin Trust <http://whaledolphintrust.org.nz/projects/hectors-dolphins/>



# Part 2: The Learning Programme

## THE SOUTH ISLAND HECTOR'S DOLPHIN/HECTOR'S DOLPHIN/UPOKOHUE - A LEVEL 3 LEARNING PROGRAMME FOR PRIMARY SCHOOLS

This programme aims to:

- 1 Increase awareness and understanding of the Hector's Dolphin/Upokohue with a specific focus on the sub species the South island Hector's Dolphin/Upokohue.
- 2 Understand the status of the South Island Hector's Dolphin/Upokohue and the main threats towards their thriving wellbeing and survival.
- 3 Explain what is being done and what 'you' can do to help and protect the South Island Hector's Dolphin/ Upokohue.



### Inquiry learning & the South Island Hector's Dolphin/Upokohue programme

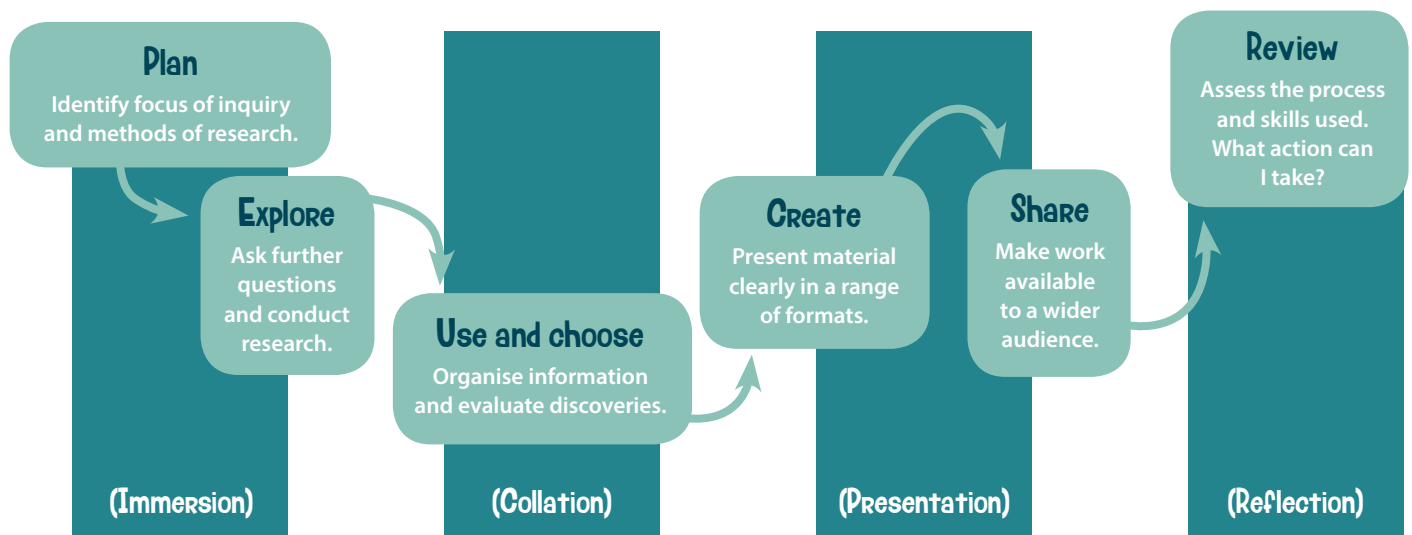
This unit is designed as an inquiry. Two of these sessions will be facilitated by a Black Cat Cruises educator and local Rūnanga. Others can be developed as you, the teacher, see as appropriate for the class. There is room for complementary inquiries into other aspects of the Hector's Dolphin/Upokohue and the sub species and human impact on them, depending on the time available. Each session generally runs for an hour.

The programme works most effectively as part of an inquiry learning programme. Teachers or facilitators using an inquiry learning approach seek to:

- Encourage students to formulate their own questions in a chosen area of study.
- Enable students to research their questions using a variety of methods and contexts.
- Provide opportunities for students to present their learning to their peers, and sometimes to the wider community, in a suitable way.
- Assist students to reflect upon and evaluate what they have learned.
- Generate ideas for further study and/or action based upon their learning.

This last point - **action** - is central to the approach of the South Island Hector's Dolphin/Upokohue learning programme. The programme's ultimate aim is for your students to create and implement their own plan of action to raise awareness and engagement in the plight of the Hector's Dolphin.

The action-inquiry method is the basis of Education for Sustainability, which seeks to engage students in contemporary environmental issues and to meet the challenges of living sustainably.





## Structure of the learning programme

The programme is divided into four sections. Each section is supported by **hour 'sessions'**, with relevant activities and information included in the student workbook to support learning.

TEACHING SESSIONS	STUDENT ACTIVITIES
<b>SECTION A: IMMERSE YOURSELF</b>	
<b>Session 1:</b> Facilitated by classroom teacher <b>Tuning in</b> - Exploring prior knowledge and understanding: <b>New Zealand's marine environment</b>	<b>Activity 1:</b> Marine Environment: My first thoughts <b>Activity 2:</b> New Zealand's Marine Environment - Quick fire facts
<b>Sessions 2:</b> Facilitated by classroom teacher <b>Tuning in</b> - Exploring prior knowledge and understanding: <b>New Zealand's marine mammals</b>	<b>Activity 3:</b> New Zealand's marine mammals <b>Activity 4:</b> Marine Mammals - compare and contrast
<b>Session 3:</b> Facilitated by the classroom teacher <b>Tuning in</b> - Exploring prior knowledge and understanding: <b>Introducing the Hector's Dolphin/Upokohue</b>	<b>Activity 5:</b> Become a Hector's Dolphin/Upokohue reporter!
<b>Session 4:</b> Facilitated by <b>Black Cat Cruises and Te Hapū o Ngāti Wheke (Rāpaki)</b> <b>Delving deeper</b> - Your marine environment: <b>Banks Peninsula/Te Pātaka o Rākaihautū and the South Island Hector's Dolphin/Upokohue</b>	<b>Facilitated by Black Cat Cruises and Te Hapū o Ngāti Wheke (Rāpaki)</b> <b>Activity 6:</b> A visit from Black Cat Cruises and Papatipu Runanga
<b>Session 5:</b> Facilitated by classroom teacher <b>Delving deeper</b> - An appreciation of the <b>South Island Hector's Dolphin/Upokohue</b>	<b>Activity 7:</b> Why the Hector's Dolphin/Upokohue is like no other
<b>Session 6:</b> Facilitated by classroom teacher <b>Delving deeper</b> - An appreciation of the South Island Hector's Dolphin/Upokohue	<b>Activity 8:</b> Getting along - You and the Hector's Dolphin/Upokohue <b>Activity 9:</b> Feeding time - it is all in the 'CLICK!'
<b>Session 7:</b> Facilitated by <b>Black Cat Cruises and Te Hapū o Ngāti Wheke (Rāpaki)</b> South Island Hector's Dolphin/Upokohue Te Whakaraupō/Lyttelton Harbour cruise	<b>Facilitated by Black Cat Cruises and Te Hapū o Ngāti Wheke (Rāpaki)</b> (up to 2 hours) <b>Activity 10:</b> Whakaraupō Upokohue Cruise: Kei hea te kaitiaki!/ Spot the Kaitiaki!
<b>SECTION B: INVESTIGATION: HECTOR'S DOLPHIN</b>	
<b>Sessions 8 and 9:</b> Facilitated by the classroom teacher <b>Reflect, evaluate, act:</b> Become a South Island Hector's Dolphin/Upokohue expert - <b>threats and protection</b>	<b>Activity 11:</b> Threats <b>Activity 12:</b> Protections
<b>SECTION C: SHOUT IT FROM THE SHORES</b>	
<b>Session 10:</b> Facilitated by the classroom teacher <b>What can we do to fix it:</b> Taking action for the South Island Hector's Dolphin/Upokohue	<b>Activity 13 and beyond:</b> Sharing our knowledge and ideas

### What you need to do prior to teaching the programme:

- **RESOURCES:** Contact Black Cat Cruises for the Teacher and Student books to support the teaching of this unit.  
Black Cat Education Co-Ordinator: **Ph: 03 328 9079, education@blackcat.co.nz**
- **BOOK:** Book **Black Cat Cruises** for at least Session 4 and Session 7.  
Black Cat Education Co-Ordinator: **Ph: 03 328 9079, education@blackcat.co.nz**
- **CONTACT:** Contact possible guest speakers: e.g. the Department of Conservation (DOC): **christchurch@doc.govt.nz**,  
The New Zealand Whale and Dolphin Trust: **info@whaledolphintrust.org.nz**
- **BOOKS & IMAGES:** Bring into classroom any books or images on the topic of Hector's Dolphin/Upokohue, especially the South Island Hector's Dolphin/Upokohue.

# Section A: Immerse yourself

## Specific learning intentions

To develop an understanding of the New Zealand unique marine environment and marine mammals.

To demonstrate a growing knowledge and understanding of the Hector's Dolphin/Upokohue with a specific focus on the South Island Hector's Dolphin/Upokohue and the threats they face.

## Success criteria

I can:

- Describe what a marine environment is and why New Zealand's marine environment is special.
- Define a marine mammal; describe some of New Zealand's endemic marine mammals. Analogise - how some are different and some are the same.
- Compare/contrast: The Hector's Dolphin/Upokohue - the Maui and South Island Hector's Dolphin/Upokohue.
- Describe/tell 'me' about the South Island Hector's Dolphin/Upokohue including what they look like, what they eat, special behaviours, threats and what is being done to protect them.

## SESSION 1 - 3: TUNING IN - EXPLORING STUDENTS' PRIOR KNOWLEDGE, UNDERSTANDING AND ATTITUDES

### SESSION 1:

### Tuning in - Getting to know the marine environment

Facilitated by the classroom teacher

**LEARNING INTENT** This session is designed to provide the students with basic background knowledge and understanding of the marine environment. The knowledge gained during this session will provide context and depth of learning in regards to the New Zealand's Marine Environment and the South Island Hector's Dolphin/Upokohue.

## IN CLASS ACTIVITIES

### Activity 1 Marine Environment - My first Thoughts

#### What you will need:

- Access to Wi-Fi, Smart TV or lap top and projector.
- Student workbooks.
- Black Master 1 - pg 28
- Appendix 3: Infographic 'New Zealand's Marine Environment' - pg 34

#### Watch one or both of the below short 3min marine environment video clips:

- Source: BBC - Inspiring visuals of the marine environment with accompanying music. [www.youtube.com/watch?v=qwIRW\\_Rx6KA](https://www.youtube.com/watch?v=qwIRW_Rx6KA)
- Source: National Geographic - This short film has both amazing images of the marine environment including marine mammals as well as key messages from marine scientists. (NB: It does have an advertisement before the clip begins). [video.nationalgeographic.com/video/why-ocean-matters](https://video.nationalgeographic.com/video/why-ocean-matters)

Ask the children to reflect on the video clip and write down their thoughts in the table provided in their workbooks.

The students share their thoughts with a partner/group/ the class.



STUDENT WORKBOOK PAGE 2

Activity 1: My first thoughts

What are you wondering?

What does it make you think about?

Why might this be worth learning about?

What does this remind you of?



## Activity 2 **New Zealand's Marine Environment - Quick fire facts**

Divide the class into 6 groups. Each group is to be given **ONE** of the below Quick Fire Facts (Black master 1).

### New Zealand's Marine Environment - Quick fire facts activity

(Black Master 1 - pg 28 and Appendix 3: **Infographic** 'New Zealand's Marine Environment'- pg 34)

- 1 The New Zealand marine environment has lots of different **seascapes**.
- 2 Over half of New Zealand's marine environment is more than **1000 metres deep**.
- 3 More than **700 seamounts (mountains in the sea)** exist in New Zealand's marine environment.
- 4 Many marine **seamounts** (mountains in the sea) are **larger than Aoraki/Mount Cook**.
- 5 The New Zealand marine environment has many **plains** and **trenches**.
- 6 The huge variety in **seascape** in our marine environment means that it is **home to many different creatures**.

### Preparing

In their group and using the **infographic 'New Zealand's Marine Environment'** at the back of their workbooks, they read and establish the meaning of their Quick Fire Fact.

Using the information from the video and **infographic** provided, in their own words each group prepares a 30 second presentation on their fact to share to the class. Particular focus should be given to the detail in bold.

### Presenting

Each group has 30 seconds to share their fact with the class.

At the end of the presentations, students are asked to write facts that they found most interesting in their workbook.



#### STUDENT WORKBOOK PAGE 2

Activity 2: The New Zealand's Marine Environment - 'Quick fire fact' that interested me the most

## SESSION 2:

### Tuning in - New Zealand's marine mammals

Facilitated by the classroom teacher

**LEARNING INTENT** Session two explores the characteristics of marine mammals with a specific focus on New Zealand's marine mammals.

## IN CLASS ACTIVITIES

### Activity 3 **Video of Tauranga's marine life**

#### What you will need:

- Access to Wi-Fi, Smart TV or lap top and projector.
- Student workbooks.

Watch the video of 'Tauranga's marine life to inspire children.'

[www.nzherald.co.nz/nz/news/article.cfm?c\\_id=1&objectid=11845656](http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11845656)

Ask the children to reflect on the video clip and write down their thoughts in the table provided in their workbooks.



#### STUDENT WORKBOOK PAGE 3

Activity 3: Marine Mammal ponderings

What are you wondering? \_\_\_\_\_

What does it make you think about? \_\_\_\_\_

Why might this be worth learning about? \_\_\_\_\_

What does this remind you of? \_\_\_\_\_





## Activity 4 Marine Mammals - compare and contrast

### What you will need:

- Copies of the Department of Conservation/Te Papa Atawhai 'Marine Mammals of New Zealand' poster.
- Student workbooks.

Discuss what they believe a **marine mammal** is. Share the definition of marine mammals with the children.

Using the DOC/Te Papa Atawhai 'Marine Mammals of New Zealand' poster ask the children to choose two marine mammals.

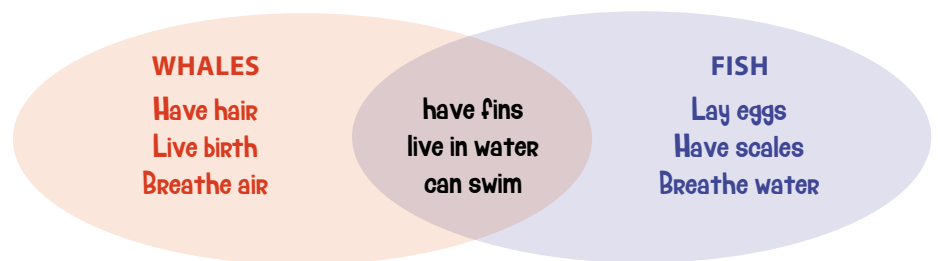
Drawing on the information from the poster, ask the students to create a **Venn diagram** to compare and contrast their chosen marine mammals.

Share with a partner/group/the class.



STUDENT WORKBOOK PAGE 3

Activity 4: Marine Mammals - compare & contrast



An example of a complete Venn diagram comparing and contrasting whales and a fish.

### SESSION 3:

## Tuning in - The Hector's Dolphin/Upokohue

Facilitated by the classroom teacher

**LEARNING INTENT** Session three introduces the children to the Hector's Dolphin/Upokohue and helps prepare them for the visit from Black Cat Cruises and local Rūnanga.



### IN CLASS ACTIVITY

Optional video: Hector's Dolphin/Upokohue fact file (3m44sec)  
[www.youtube.com/watch?v=grQ20T2ubO8](http://www.youtube.com/watch?v=grQ20T2ubO8)

## Activity 5 Become a Hector's Dolphin/Upokohue reporter!

### What you will need:

- A copy of the Department of Conservation Hector's Dolphin/Upokohue extract (Black master 2 - pg 29).
- Student workbooks.
- Writing exercise books.

Read the Department of Conservation/Te Papa Atawhai article extract to the children (*on the following page*).

Discuss with the children the content of the article, the way it was written and the design features of the article i.e. use of headline, by-line, and facts.

## HECTOR'S DOLPHIN/UPOKOHUE

**One of the smallest marine dolphins in the world, Hector's Dolphins/Upokohue grow no more than 1.5 m in length.**

Only found in New Zealand's waters, this distinctive grey dolphin with black and white markings and a round dorsal fin is the most easily recognised species of dolphin in New Zealand.

Hector's Dolphins/Upokohue are among the world's smallest marine dolphins. They are found only in the inshore waters of New Zealand.

Two sub-species of Hector's Dolphins/Upokohue exist: the South Island Hector's dolphin/Upokohue which is found around the South Island of New Zealand, and the Māui dolphin which is found off the west coast of the North Island.

They are the only dolphins in New Zealand with a rounded black dorsal fin. Their bodies are a distinctive grey, with white and black markings and a short snout.

Adult South Island Hector's Dolphins/Upokohue don't often exceed 1.5 m in length and weigh between 40 and 60 kg. Males are slightly smaller and lighter than females.

Most females only have four or five calves in a lifetime. Calving usually occurs between November and mid-February, and calves stay with their mothers for up to two years.

Traditionally, Māori watched dolphin movements to predict the weather.

*Source: DOC/Te Papa Atawhai*



Ask the children to refer to their workbooks, page 4 **Activity 5: Become a marine reporter!**

Discuss with the children that they are going to (pretend) write an article for the school newsletter on Hector's dolphin using the facts in their student workbook

**NB: if possible, choose an article to actually go in the school newsletter!**

Refer the children to the sequence of features for writing an article and read through the nine facts and discuss the activity with the children. They may also find it useful to refer back to activity 3 'New Zealand Marine Mammals – Quick fire facts' and include some of their previous learnings in the article also.



### STUDENT WORKBOOK PAGE 4

*Activity 5: Become a marine mammal reporter!*

## Become a Hector's Dolphin/Upokohue reporter!

On the next page, are 9 facts in no particular order about the Hector's Dolphin/Upokohue.

**Using at least 5 facts**, pretend you are writing a short article for the school newsletter about the Hector's Dolphin/Upokohue.

The article should follow a sequence - an order that flows and makes sense. Like any article, it should have:

- **A headline** - an eye catching title, usually only four or five words. It tries to attract the interest of the reader by telling them what the story is about, in a short and interesting way.
- **By-line** - who wrote the article.
- **Introduction** - It will set the scene and summarise the main points of the article: who, what, when, where.
- **Body** - provides more detail about your topic.
- **Quotes** - sometimes articles will include what a person (like an eye-witness or an expert) has said. These will be in speech marks. For this activity, you could make up an expert!

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**SESSION 4:**

**Delving deeper - Your marine environment**

**Banks Peninsula/Te Pātaka o Rākaihautū & the South Island Hector's Dolphin/Upokohue**

*Facilitated by Black Cat Cruises and Te Hapū o Ngāti Wheke (Rāpaki)*

**LEARNING INTENT** Session four brings to life some of the real world experiences of working 'with' the South Island Hector's Dolphins/Upokohue. We will share with the students why Banks Peninsula/Te Pātaka o Rākaihautū and Hector's Dolphins/Upokohue are special. And finally, we prepare students Session 7, the Whakaraupo/Lyttelton Harbour cruise.

**STUDENT BOOK ACTIVITY**

**Activity 6** **Getting closer**

**What you will need:**

- A projector/Smart TV
- Student workbooks (quiz)

**In summary, the lesson will cover:**

- South Island Hector's Dolphin/Upokohue: Why are they special including a life sized model of a Hector's Dolphin.
- Habitat: An overview of Banks Peninsula/Te Pātaka o Rākaihautū .
- Black Cat: Who are they and why do they do what they do.
- What to expect on the field trip;
  - chances of finding dolphins
  - what else to look for
  - what to wear
  - safety
  - how to behave on the boat.

**Please note:** *The children will receive a list of what to bring/wear for the boat trip.*



**STUDENT WORKBOOK PAGE 5**

*Activity 6: A visit from Black Cat Cruises and Papatipu Rūnanga.*



**Getting closer - A visit from Black Cat Cruises and Papatipu Rūnanga**

**What I found interesting**

.....  
.....

**What I found useful**

.....  
.....

**Questions I have for the trip**

.....  
.....



## SESSION 5:

# Delving deeper - An appreciation of the South Island Hector's Dolphin/Upokohue

Facilitated by the classroom teacher

**LEARNING INTENT** Session five focus on the uniqueness of the Hector's Dolphin/Upokohue. It explores the anatomy of the dolphin and begins to discuss what makes it so special.

## IN CLASS ACTIVITY

### Activity 7 Why the Hector's Dolphin/Upokohue is like no other

NB: Adapted from 'WWF Maui's Dolphin Activity 4: Drawing a Maui's Dolphin'

#### You will need

- Hector's Dolphin/Upokohue drawing (see Appendix 1 - pg 31).
- A white board/paper to draw a large representation of the Hector's Dolphin/Upokohue.
- Student books: Activity 7.



#### Instructions

Follow the instructions to draw a Hector's Dolphin/Upokohue on the board, while discussing distinctive features for survival and identification:

- 1 Discuss:** Imagine you were dumped at sea. How well could you survive and what challenges would you face? Talk about difficulties a human faces in the sea for example, gets cold if in too long, gets tired swimming too long, hard to stay afloat a long time (without the help of a life jacket).
  - Introduce the body that is layered in "**blubber**". Blubber is a layer of fat that insulates the marine mammal and helps them to stay warm and **buoyant**. The blubber is found all over the body.
  - **Draw a streamlined shape of a dolphin's body on the board.**
- 2 Discuss:** The marine mammal is warm and buoyant, but can't move very well. What can help the marine mammal move through the water?
  - Introduce **flukes**. The flukes are tail fins that **propel** the marine mammal through the water. The flukes can **pump up and down for a long time** without getting tired.
  - **Draw flukes on the tail of the dolphin body.**
- 3 Discuss:** Now the marine mammal is warm, buoyant and can move, but the only problem is it can only move in one direction. It can't turn. What can help it to **steer** left or right?
  - Introduce **pectoral flippers**. Inside the **pectoral flippers are bones just like our hands**, but the flippers have adapted by becoming flat and wide (webbed). The flippers help the marine mammal go **left, right or stop**.
  - **Draw pectoral flippers on the body.**
- 4 Discuss:** So the marine mammal is warm, buoyant, can move forward, left, right and stop, but it has one more problem. When it moves forward, it starts to wobble about. It's finding it hard to stay upright. What could help it stay upright in the water?
  - Introduce the **dorsal fin**. The dorsal fin acts like a rudder. It helps the dolphin **stay upright** in the water as it swims along.
  - **Draw a rounded dorsal fin on top.**
- 5 Discuss:** Take a close look at the dorsal fin. It is different from any other dolphin you'll see around New Zealand. It is short and rounded. Other dolphins have a larger, more, pointy or sickle shaped dorsal fin. Hector's Dolphin/Upokohue are a lot smaller than the other dolphins. A full grown adult is only about 1.4 metres long. Other dolphins can be nearly twice as big or bigger.
- 6 Draw the distinctive markings and colouration of the Hector's Dolphin/Upokohue and discuss how these differ from other dolphins.**
- 7 Refer the children to activity 7 in their workbooks.** Using the information sheet provided they are to write in their own words what makes the Hector's Dolphin/Upokohue special.



STUDENT WORKBOOK PAGE 6

Activity 7: Why the Hector's Dolphin/Upokohue is like no other.

**SESSION 6:**

**Delving Deeper - An appreciation of the South Island Hector's Dolphin/Upokohue**

*Facilitated by the classroom teacher*

**LEARNING INTENT** Session six takes a closer look at the behaviours of the Hector's Dolphin/Upokohue, including their life cycle. It also touches on what they like to eat and how they go about finding and securing their food.

**IN CLASS ACTIVITIES**

**Activity 8 Getting along - You & the Hector's Dolphin/Upokohue**

**You will need**

A large piece of paper/whiteboard, markers, student books.

Talk to the **children about the makeup of their home** writing notes and generalisations up on a large piece of paper/white board for the children to see. Ask them about;

- the people e.g. how many, who and the ages of each person
- their house - where you live, the type of house it is
- relationships – does everyone get along all of the time etc.?

Putting that aside, talk to the children about the **Hector's Dolphin/Upokohue and the makeup of 'their home'**.

- They live in social groups known as pods.
- The pods consist of between 2 and 12 other dolphins with several males or several females and their calves.
- The dolphins create very strong bonds within their smaller, 'family' pod.
- Like many groups living together, there are times where they become hostile towards each other. They can bite or blow bubbles and splash their tails. Although this can be a sign of play it can also serve as a warning to other dolphins to keep their distance.
- The smaller 'family' pods sometimes join other larger groups of 20 - 30, and at times form pods as large as a 100 or so dolphins.
- They tend to stay in the same area – sometimes for life. Here, they spend their days swimming along the coastline, surfacing to breathe, diving to find food and playing.

**Using the Venn diagram in their student books, ask the children to compare and contrast their 'family' with the Hector's Dolphin/Upokohue 'pod', identifying the difference and the similarities.**



**STUDENT WORKBOOK PAGE 8**

*Activity 8: Getting along - You and the Hector's Dolphin/Upokohue*



**Thinking about your home and family**

**Including yourself, how many people live in your house?**

**Describe your house e.g. how many bedrooms, how long you have lived there.**

**Relationships – who lives at your house and does everyone get along all of the time etc.?**

**Thinking about the Hector's Dolphins/Upokohue home**

They live in social groups known as pods.

The pods consist of between 2 and 12 other dolphins with several males or several females and their calves.

The dolphins create very strong bonds within their smaller, 'family' pod.

Like many groups living together, there are times where they become hostiles towards each other. They can bite or blow bubbles and splash their tails. Although this can be a sign of play it can also serve as a warning to other dolphins to keep their distance.

The smaller 'family' pods sometimes join other larger groups of 20-30, and at times form pods as large 100 or so dolphins.

**Using the Venn diagram, compare and contrast your 'family' with the Hector's Dolphins/ Upokohue 'pod'**

## Activity 9 Feeding time - it is all in the 'CLICK!'

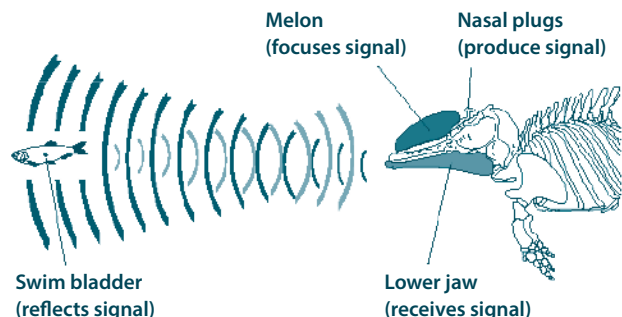
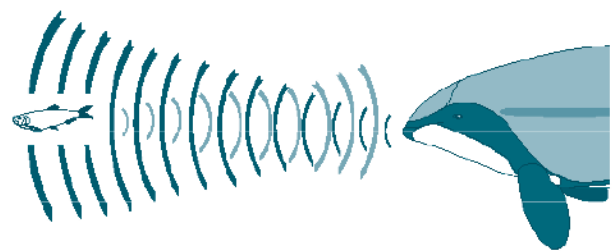
NB: Adapted from 'WWF Maui's Dolphin Activity 9: Clever clicks echolocation

### You will need

- To hear the sound of the Hector's Dolphin/Upokohue visit: [whaledolphintrust.org.nz/projects/hectors-dolphins/](http://whaledolphintrust.org.nz/projects/hectors-dolphins/)
- 3 blindfolds.
- Echolocation in Hector's Dolphin/Upokohue dolphin drawing (Appendix 2 - pg 32).

### Instructions

- 1 Form a circle, close enough together so students can just touch hands. Choose one student to be the Hector's Dolphin/Upokohue dolphin and hand her/him a blindfold to wear. Ask the students why the dolphin is wearing a blindfold when in real life dolphins can see well (this is because Hector's Dolphin/Upokohue sometimes hunt for their prey in murky shallow waters where they cannot rely on their sight).
- 2 Ask what type of fish Hector's Dolphin/Upokohue eat (flounder, red cod, mackerel, crabs and squid).
- 3 Choose two students to be the prey and give them blindfolds for the same reason as above.
- 4 The idea of the game is for the Hector's Dolphin/Upokohue to try and catch a fish. But with no sight the dolphin must use **echolocation**. Bring the dolphin and fish into the circle (with blindfolds off) and demonstrate how the dolphin will say "click" to represent the sound a Hector's Dolphin/Upokohue makes when it is trying to work out what is in its surroundings. **The crucial instruction is that every time the dolphin says "click" the fish MUST reply "fish" as quickly as possible to represent the sonar sound bouncing off the fish and echoing back to the dolphin.** In this way, the dolphin can "hear" where the fish are and has to try to catch them! Ensure the students understand their roles - dolphin says "click" and must try to catch the fish; fish must reply "fish" whenever they hear a "click" and have to try to avoid being caught.
- 5 Ask students to put their blindfolds on and have three other students spin them around to disorient them. The rest of the students should spread their arms to complete the circle and stay quiet. Their job is to gently prevent the fish and dolphin wandering outside the circle.
- 6 Start the game! Stop when one fish has been caught and give other students a turn. A dolphin student should quickly discover that by saying "click", "click", "click", "click" in quick succession (but waiting briefly for an answer), they will get the most information possible and can hone in on a fish quicker! If your students do not try this technique, suggest it to the 2nd or 3rd dolphin. You may also like to try the game with two dolphins working together to catch one fish. Is it easier or more difficult to interpret the clicks and echoes?
- 7 Discuss what was easy and what was difficult about the game from the fish and the dolphin's point of view. What would be similar or different when a real dolphin tries to catch a real fish?
- 8 You may like to show students the Echolocation in Hector's Dolphin/Upokohue drawing, to reiterate how echolocation works and/or the parts of the dolphin involved in echolocation.
- 9 Ask the students what else could Hector's Dolphin/Upokohue use their echolocation or click sounds for?



### STUDENT WORKBOOK PAGE 9

Activity 9: Feeding time - it is all in the 'CLICK!'

Can you name 3 fish that the Hector's Dolphin/Upokohue likes to eat?

.....

.....

What other reasons other than finding food does the Hector's Dolphin/Upokohue use echolocation for?

.....

.....

.....

Source: S Dawson (WWF Maui's Dolphin - an inquiry to action)



## SESSION 7:

# Whakaraupō/Lyttelton Harbour Hector's Dolphin/Upokohue Cruise

Facilitated by Black Cat Cruises and Te Hapū o Ngāti Wheke (Rāpaki)

**LEARNING INTENT** Session seven aims to show the students the Hector's Dolphins/Upokohue in their natural environment. While this is not guaranteed, there are lots of other things to see around the harbour which can help reinforce how special the marine environment is.

## Activity 10 Kei hea te kaitiaki! / Spot the Kaitiaki!

### What you will need:

- A pen.
- **Black Cat Cruises will supply an A4 i-spy activity sheet** on the day. Listen closely to what the skipper says and have your eyes peeled to find as many things listed on the sheet as possible.

### A summary of the 90min boat trip:

- Welcome/Safety.
- How to spot a dolphin.
- Reinforce the Banks Peninsula/Te Pātaka o Rākaihautū marine environment i.e. Volcanic, sediment.
- Sample set net on board to show.
- Dolphin Sounds to play.
- Skipper to explain how to interact with dolphins when on a boat.
- **Activity 10:** During the boat trip 'Kei hea te kaitiaki! / Spot the Kaitiaki!'



### Kei hea te kaitiaki! / Spot the Kaitiaki!

Before there were maps to tell us where we are, Māori had a way of telling where they were by navigating through using stars, landmarks most importantly the many animals that tell you if you are close to land.

*While you are out on the harbour have a look for some of the following:*

**Te Poho ō Tamatea** - This is the maunga sitting above Rāpaki.

**Te Ahu Pātiki** - This maunga is one of the tallest in the area.

**Ūpokohue** - A friendly kaitiaki that tells us we are very close to the coast.

**Karoro** - The Black backed seagull is a sea bird but will always be within a few kilometres of land.

**Kororā** - The blue penguin another kaitiaki of the area also tells us that we are near the coast.

**Kekenō** - The seal traditionally was both a source of food and a kaitiaki of the foreshore.

**Ōtamahua** - An early name for Quail island on which rangatahi (young people) were sent to gather eggs to eat.

**Tohorā** - Whales, sometimes we see these giant travellers of the sea as they make their way to te ara nui a takaroa.



STUDENT WORKBOOK PAGE 10

Activity 10: Whakaraupō Upokohue Cruise: Kei hea te kaitiaki! / Spot the Kaitiaki!

Reflections from the day

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# Section B: Investigation: Hector's Dolphin/Upokohue

## Specific learning intentions

To apply previous knowledge and understanding and apply it to the threats and protection of the Hector's Dolphin/Upokohue.

To theorise possible ways and outcomes to protect the Hector's Dolphin/Upokohue while considering the impact on groups and individuals affected by them.

## Success criteria

I can:

- Relate knowledge and understanding about the Hector's Dolphin/Upokohue and apply it to practical ways to protect them.
- Predict possible effects on individual and groups who may have different values than me and include that in my ideas.

### SESSION 8 & 9:

## Reflect, evaluate, act: A marine mammal under threat

Facilitated by the classroom teacher

**LEARNING INTENT** Session 8 and 9 focus on what makes a species threatening and the greatest threats to the survival of the Hector's Dolphin/Upokohue. It also investigates the protection measures being put in place to ensure the Hector's Dolphin/Upokohue population continues to increase.

### IN CLASS ACTIVITY

## Activity 11 It is all in the classification!

### You will need

- Black Master 3 (pg 30): New Zealand Threat Classification System (NZTCS).
- Learning programme - below background information.
- Student workbooks - Activity 11: It's all in the classification!

### Discussion points:

- Both the South Island Hector's/Upokohue and Māui Dolphins are **threatened**.
  - Around 45 years ago there was an approximate total of 30,000 Hector's dolphin/Upokohue.
  - The last 40 years have seen a rapid decline in their populations.
  - The Department of Conservation/Te Papa Atawhai and the International Union for the Conservation of Nature (IUCN) classify both sub-species as threatened.
- 1 **Māui's Dolphins are 'nationally critical'**. The latest population (2015) estimate for **Māui's Dolphin puts their population at only 50 dolphins** over the age of one.
  - 2 The **South Island Hector's Dolphins/Upokohue** are listed as **'nationally endangered'**. In 2016, a study by Cawthron Institute estimated between **12,000 - 18,500** living in and around our South Island shores. This is up from the **original estimate of only 7000** but they are still constantly under threat.

### Lesson

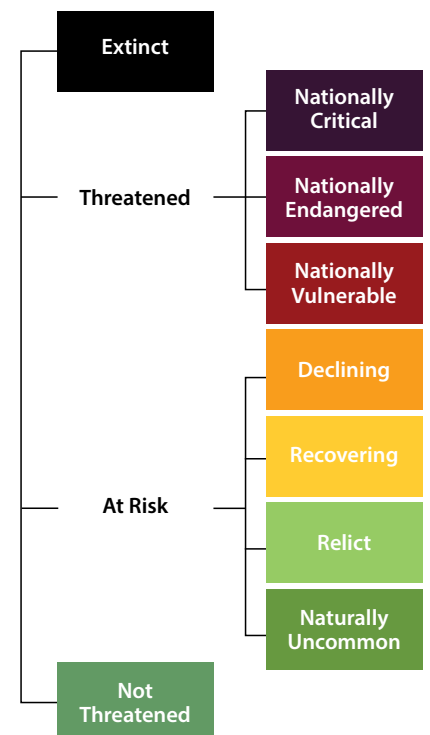
Ask the children how they would decide whether a mammal was endangered.

**Answer's may include:** how many there are left, if their habitats are disappearing, how many we see.

Discuss with the children any species in New Zealand that they know are **threatened** and/or **endangered**. Write these up on the white board or large piece of paper.

Write their answers on the board/paper beside the named threatened animals.

Introduce and discuss with the children the **New Zealand Threat Classification System (NZTCS)** (Black master 3).



New Zealand Threat Classification System (NZTCS) Source: DOC.

## NATIONALLY CRITICAL CRITERIA

- Very small population.
- Total area where they live very small.
- Population with a very high ongoing or predicted decline.

## NATIONALLY ENDANGERED CRITERIA

- Small population that has a low-to-high ongoing or predicted decline.
- 250 - 1000 mature individuals or 1000 - 5000 mature individuals, predicted decline 50 - 70%.
- Total area where they live is small.
- Moderate population and high ongoing or predicted decline.

Source: Summarised from DOC:  
[www.doc.govt.nz/Documents/science-and-technical/nztc17entire.pdf](http://www.doc.govt.nz/Documents/science-and-technical/nztc17entire.pdf)



### Key points:

- It **assesses** the conservation status of groups of plants, animals and fungi. For most groups a panel of species experts meets to assess the status of species in their group. The experts use information from databases, scientific publications and information from the public as well as their own knowledge.
- The results of the expert panels' assessments are stored in the NZTCS database. DOC oversees the system in New Zealand.
- The classification systems long-term goal is to list existing species according to their threat of extinction.

Using the **New Zealand Threat Classification System** (Black master 3 & Student book page 11) find New Zealand example's for the following classifications;

#### 1 Extinct

- 2 Threatened
- *Nationally Critical*
  - *Nationally Endangered*
  - *Nationally Vulnerable*

#### Useful websites

**Department of Conservation:** [www.doc.govt.nz/nature/conservation-status/threatened-birds](http://www.doc.govt.nz/nature/conservation-status/threatened-birds)

**Endangered Species Foundation:** [www.endangeredspecies.org.nz/projects/10-most-endangered](http://www.endangeredspecies.org.nz/projects/10-most-endangered)

**The Redlist** [www.redlist.org](http://www.redlist.org)

#### Examples include:

1 **Extinct** - Moa, huia, short-tailed bat, Northland skink.

#### 2 Threatened

- *Nationally Critical* - Maui's Dolphin, Kakapo, White Heron, Orca/Killer whale, Burgan skink.
- *Nationally Endangered* - South Island Hector's Dolphin/Upokohue, Yellow-Eyed Penguin, Kea, Bottlenose dolphin, Whitaker's skink.
- *Nationally Vulnerable* - Wrybill, Whio (Blue duck), Southern right whale, Ground Weta, Southern striped gecko.

And for your information:

#### 3 At Risk

- *Declining* - North Island brown kiwi, Eastern bar-tailed godwit, Jewelled gecko.
- *Recovering* - Little spotted kiwi, Cloudy gecko.
- *Naturally Uncommon* - Black-fronted dotterel.

4 **Not Threatened** - Korimako/Bellbird, Tui, Piwakawaka/South Island fantail, New Zealand fur seal, Yellow-bellied sea-snake.

Bring the children back together and share their lists.

Bring to attention where the *South Island Hector's Dolphin/Upokohue and Maui's Dolphin* sit within the classification system.

Compare it with the *North Island brown kiwi (at risk - declining) and Little spotted kiwi (at risk - recovering)*.

**Discuss** - questions may include why do you think the Kiwi gets so much attention? Why do you think the Little spotted kiwi is now recovering?



STUDENT WORKBOOK PAGE 11

Activity 11: It is all in the classification!

## Activity 12 Threats & protection

### THREATS

Ask the children to open their books to Activity 12: Threats and protection.

Watch the You Tube Video '**Endangered Dolphins in New Zealand**' and ask children to write key word/notes as they watch.

[www.youtube.com/watch?v=BskpWYz\\_n\\_M](http://www.youtube.com/watch?v=BskpWYz_n_M)

Discuss with the children the **MAIN POINTS** they learnt from the video. Write them on the board/large piece of paper. These may include;

- The dolphins spend most of the time close to shore - **about 30km off the coast**.

*Please note: Depending on the children's engagement, this activity may need to go over two one hour sessions.*



- This is also where **most human activity happens**.
- The biggest threat by far to the dolphin is close to shore net **fishing**.
- **Entanglement in fishing nets** is the number one threat to NZ dolphins, in particular **trawl** and **gill** nets.
- **Trawl nets** - the dolphin feeds off the smaller fish stirred up by the nets. They usually can detect them but sometimes get caught and drown.
- **Gill nets** - they are set not dragged, and are made of nylon. The dolphin finds it very hard to detect them and often gets entangled and drowns. They are the biggest threat out of the two nets.
- The Hector's Dolphin/Upokohue population can lose up to 10 dolphins per year and still increase.
- The trawls and gill nets are known to kill between 110-150/year therefore the populations are readily decreasing.

If the children don't bring up the above, discuss these with them. Discuss other threats including boating, mining, coastal development, pollution and tourism.

Using the points discussed, ask the children to update their notes in their workbooks.

### PROTECTION

Split the children into groups of 4 - 6.

Give them a large piece of paper and pens and ask them to fold it in half length ways.

On the left side give the children 5 mins to write all the ways they can think that would protect the dolphins from the threats discussed.

Once the 5mins is up, ask the children to write on the right side reason why their protection ideas may not work or be challenged and by whom.

After 5 mins, ask the children to stop and come back together as a class.

Ask one student from each group to share their ideas and challenges.

### Marine sanctuaries - a local example...

Discuss Banks Peninsula/Te Pātaka o Rākaihautū as a Marine Sanctuary and why it was set up.

Ask the children to refer to their workbooks Activity 12: Protection, and the map of the Banks Peninsula/Te Pātaka o Rākaihautū marine sanctuary.

What does the map show us?

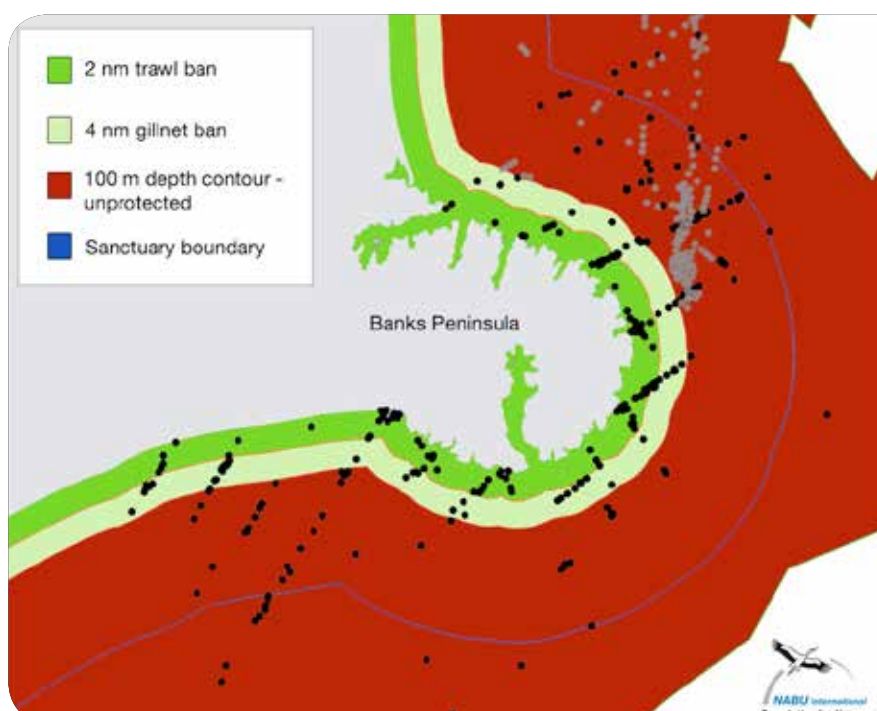
*In their work books, ask the children to analyse the map and write:*

- what they think is working well.
- what needs improving.
- and the challenges and compromises they may face if they were to put those improvements into place.



STUDENT WORKBOOK PAGE 12

Activity 12: Threats and Protection



Dolphin sightings off New Zealand's Banks Peninsula Marine Mammal Sanctuary (grey and black dots) clearly show that Hector's dolphins range far beyond the boundary of the protected area (blue line). The population is therefore exposed to both gillnetting and trawling across most of its range.

**Black dots:** dolphin research sightings.

**Grey dots:** dolphin sighting by government fisheries observers.

*Adapted from Marine Sciences Department, University of Otago and Ministry of Primary Industries.*

## MARINE MAMMAL SANCTUARIES

are designed to protect marine mammals from harmful human impacts, particularly in vulnerable areas such as breeding grounds and on migratory routes. This has been done in various ways such as restricting commercial fishing and certain methods of recreational fishing.

## Section C: Shout it from the shores!

### Specific learning intentions

Students will:

Create rich questions for inquiry.

Understand the endemic value and threatened status of the Hector's Dolphin/Upokohue; its behaviour, relationships and feeding patterns; the predominant threats it faces and protections put in place; and future challenges ahead

Explore values and build their understanding that people's views and values about the environment can be varied, and reflect on their own values.

Practice and develop group and cooperative skills.

Link their knowledge to the real life situation (transference).

### Success criteria

I can:

Establish my own inquiry questions.

Reflect on my understanding of the Hector's Dolphin/Upokohue and its endemic and threatened status

Apply my knowledge of Hector's Dolphin/Upokohue including its behaviour, relationships and feeding patterns; the predominant threats it faces and protections put in place; and future challenges ahead

Reflect on my knowledge and understanding and create ideas and actions to be used to help protect the Hector's Dolphin/Upokohue while considering other people's views and values.

Work with others to develop a plan of action.

### SESSION 10 & BEYOND:

## What can we do to fix it – Taking action for the South Island Hector's Dolphin/Upokohue

*Facilitated by the class teacher (Black Cat Cruises and/or local Rūnanga may be available on request)*

**LEARNING INTENT** This section involves the students inquiring into one aspect of the South Island Hector's Dolphin/Upokohue and develop an outcome i.e. presentation, performance, information to share with a chosen target audience. This could be through a video presentation, an advertising campaign or a story book e.g. from the point of view dolphin.

**Please note:** There are **no student workbook activities** for this section. The planning and presentation work can be done in their exercise books, folders and/or whatever other form they usually do their 'inquiry' work in.

### TAKING ACTION

This is the student's first opportunity to take action and make a difference towards the ongoing protection and survival of the South Island Hector's Dolphin/Upokohue. By becoming 'experts' in this inquiry process and determining how to share this knowledge with a target audience, students are helping to educate others and raise awareness about the problem, as well as promoting actions that their audience can take.

It is important for students to make the connection between their presentation and the next steps that both they and their target audience can take.

***This section is designed to take approximately 1-2 weeks of in-school time.***

### SESSION OUTCOMES

#### ***Raising awareness***

The first part of this section focuses on raising awareness of the South Island Hector's Dolphin/Upokohue. Students work together to develop a presentation about the story of the dolphin e.g. a video presentation, advertising campaign, play, pamphlet or story book. Students choose the information, how it will be presented and who they will present to.

#### ***Practical action***

The second part of this section is for students to consider how they can work with their audience to make a difference. Students present their audience with a 'take action' challenge, something they can work on together after the initial presentation/performance.

Producing a play, a pamphlet and delivering it, a story book, a video etc. are all part of the taking action component, as long as students target their audience and deliver it appropriately.



## Activity 13 & beyond

### The Story of the Hector's Dolphin/Upokohue

Explain to students that they are going to use all of their knowledge and experience to-date to put together a dramatic performance or presentation of some sort about the story of the Hector's Dolphin/Upokohue. There is huge potential here for creative and powerful stories.

Students are divided into groups of 2 or 3 and within each group, students can take on different roles e.g. script writing, producing, acting, developing technology etc.

Relate to the students that they have a time period of up to 2 weeks to work on this which includes some in-class planning time, some outside class time and 3 other class periods.

#### Getting Started

You could start this session with a brainstorm about the South Island Hector's Dolphin/Upokohue and link back to previous activities. Discuss the following questions:

- Why is the Hector's Dolphin/Upokohue so special?
- What kinds of things did we learn from our visit from Black Cat Cruise and local Rūnanga?
- What kinds of things threaten the Hector's Dolphin/Upokohue?
- What human activities threaten the life of the Hector's Dolphin/Upokohue and what protection are already in place?
- Is there any way you could change the way we protect the Dolphin to ensure it doesn't become extinct and the population increase?

#### Presentation Ideas

This could be an advertising campaign or a story book from the point of view of a Hector's Dolphin/Upokohue). Or they could focus on one area of the Hector's Dolphin/Upokohue such as threats and protection, outlining their recommendations and possible challenges.

Other ideas include:

- A dramatic play, short movie or animated video about all or an aspect of the Hector's Dolphin/Upokohue
- A performance demonstrating a day in the life of a Hector's Dolphin/Upokohue explaining who and what it sees and experiences along the way and the impacts of this them and their pod, aquatic life etc. This performance could be an overview of human impact on the life of the dolphin or focus on one particular aspect of the life of the dolphin i.e. feeding, breeding, relationships etc.
- Developing a web page about of the dolphin
- Creating a computer presentation or pamphlet for commercial fishing operators and/or boat owners about the Hector's Dolphin/Upokohue, why it is so special and what they can do to limit their impact on the dolphin.

#### Target audience

Each group of students presents/performs to a different target audience. They need to think about whom to invite, how to invite that audience. Students, together with the classroom teacher choose each groups target audience. On completion, students could also send their work to outside groups or organisations such as Ngāi Tahu and/or local rūnanga, Black Cat Cruises, Port of Lyttelton, marine tourism and operators, boat clubs and owners and commercial fishing operators.

Possible target audiences: a class from within their school or a neighbouring primary school, teachers from another class, Board of Trustees, a local business/business owners, parents, grandparents, local community groups, Ngāi Tahu, Environment Canterbury and Christchurch City Council staff.

Taking their message further – Film Challenge! There may be a local or nationwide competition that students could link in with and enter their movie/animation into. E.g. the Outlook for Someday Sustainability Film Challenge: [www.theoutlookforsomeday.net](http://www.theoutlookforsomeday.net).

#### Reflection

During the times set aside for this presentation/performance, groups could meet with another group to share their learning or meet with the teacher to ask questions, discuss what they are putting together and check they are on the right track.

## THINGS WE CAN ALL DO

**Report any set nets or trawlers operating within an area closed to these types of fishing by phoning the Ministry of Fisheries hotline: 0800 4 POACHER (0800 476 224).**

**Report sightings: If you see a Hector's Dolphin/Upokohue being harassed, stranded or severely injured or dead contact 0800 DOC HOT (0800 362 468). Also, if you or a member of your family or friends catch a Hector's Dolphin/Upokohue in a fishing net, you also need to call 0800 DOC HOT (0800 362 468)".**

**Be boat smart around dolphins. Use a 'no wake' boat speed within 300 metres of them. New Zealand law makes it illegal to harass any marine mammal. If you see a dolphin being harassed, or find a stranded or dead dolphin, report it straight away to DOC on 0800 DOC HOT (0800 362 468).**

**Fishing gear and other rubbish thrown overboard poses a serious risk to Maui's Dolphins and other marine life. Make sure you take any rubbish back to shore and please retrieve any abandoned 'ghost' nets that you come across. Make sure your rubbish stays out of storm water drains. Secure lids on bins and pick up any rubbish you see in the gutter or on the beach.**



**1**

The New Zealand marine environment has lots of different seascapes.

**2**

Over half of New Zealand's marine environment is more than 1000 metres deep.

**3**

More than 700 seamounts (mountains in the sea) exist in New Zealand's marine environment.

**4**

Many marine seamounts (mountains in the sea) are larger than Aoraki/Mount Cook.

**5**

The New Zealand marine environment has many plains and trenches.

**6**

The huge variety in seascape in our marine environment means that it is home to many different creatures.

One of the smallest marine dolphins in the world, Hector's Dolphins/Upokohue grow no more than 1.5 m in length.

**Only found in New Zealand's waters, this distinctive grey dolphin with black and white markings and a round dorsal fin is the most easily recognised species of dolphin in New Zealand.**

Hector's Dolphins/Upokohue are among the world's smallest marine dolphins. They are found only in the inshore waters of New Zealand.

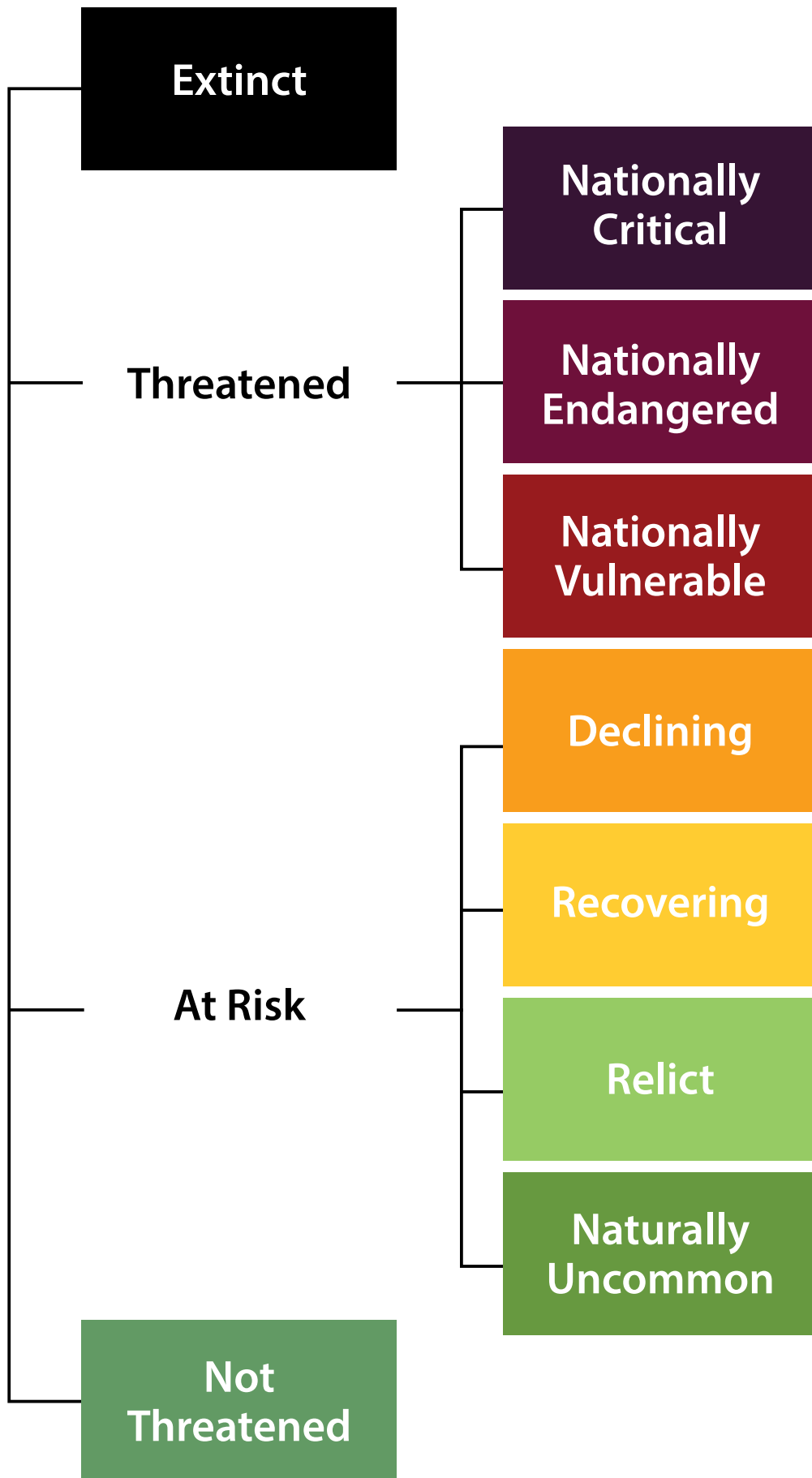
**Two sub-species of Hector's Dolphins/Upokohue exist: the South Island Hector's dolphin which is found around the South Island of New Zealand, and the Māui dolphin which is found off the west coast of the North Island.**

They are the only dolphins in New Zealand with a rounded black dorsal fin. Their bodies are a distinctive grey, with white and black markings and a short snout.

**Adult South Island Hector's Dolphins/Upokohue don't often exceed 1.5 m in length and weigh between 40 and 60 kg. Males are slightly smaller and lighter than females.**

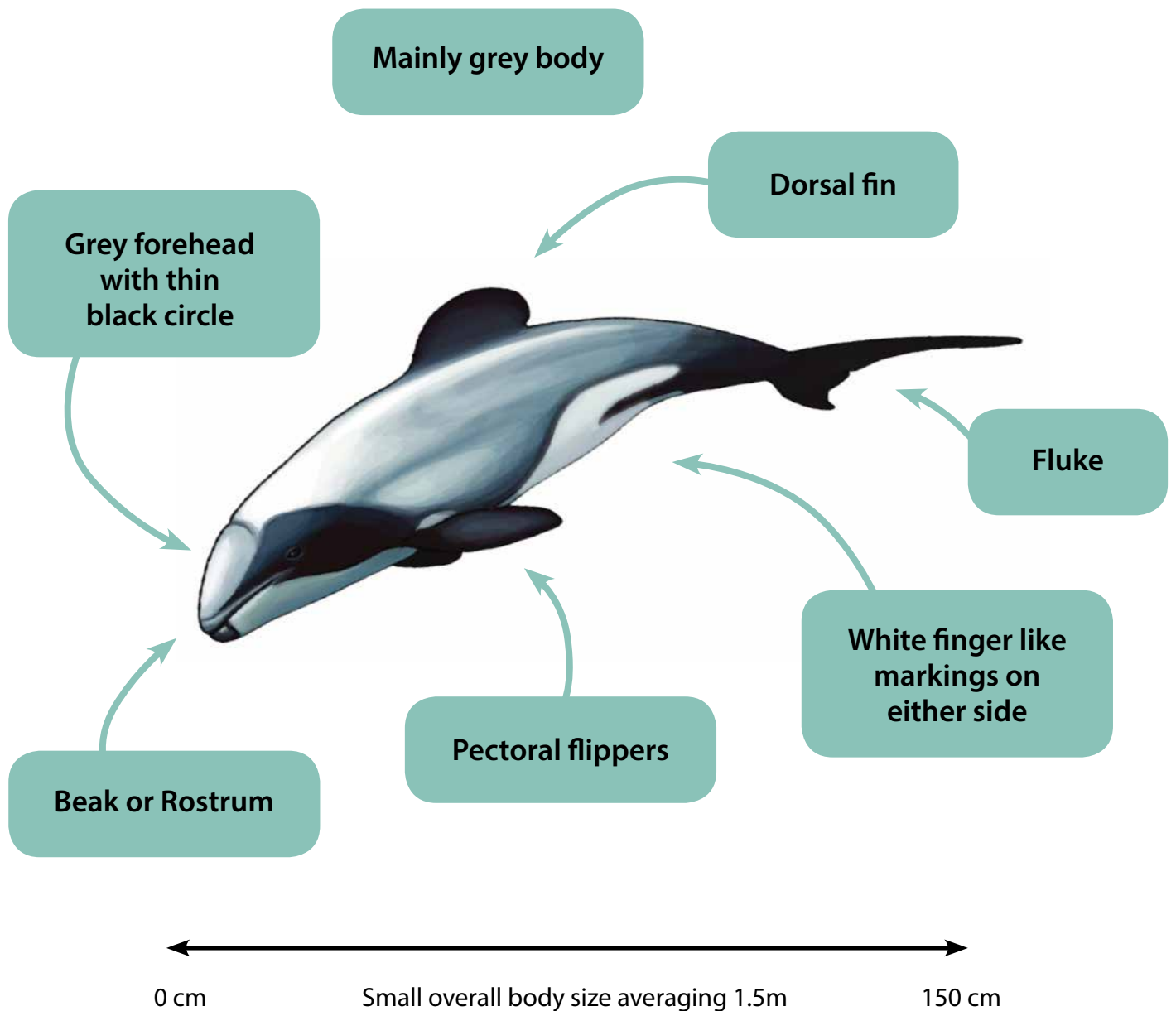
Most females only have four or five calves in a lifetime. Calving usually occurs between November and mid-February, and calves stay with their mothers for up to two years.

**Traditionally, Māori watched dolphin movements to predict the weather.**



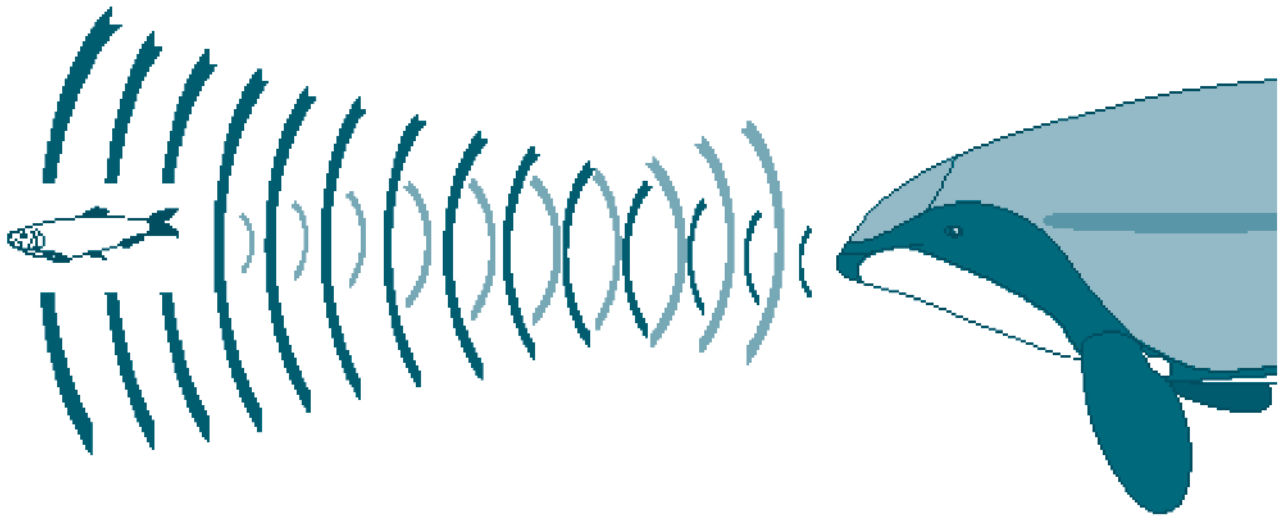


# Appendice 1: Why is the Hector's Dolphin/Upokohue like no other?



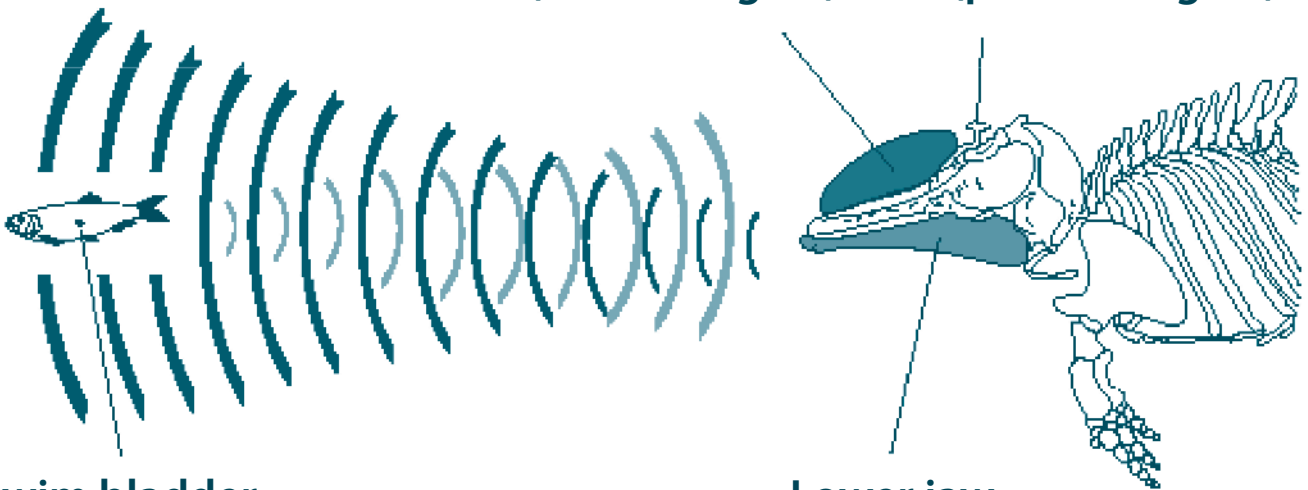
## Key words and helpful information

- Blubber** - insulates, buoyant
- Tail fin** - propels, pump up and down for a long time
- Steering** - left and right, stop, bones, just like hands
- Rudder** - upright in the water
- Rounded**
- 1.5 metres**



Melon  
(focuses signal)

Nasal plugs  
(produce signal)



Swim bladder  
(reflects signal)

Lower jaw  
(receives signal)





# Appendix 3: New Zealand's Marine Environment

New Zealand's rich and complex marine environment is **subtropical** (warm) to subantarctic (cool). This means New Zealand has many different marine habitats, with over 15,000 known **species**.

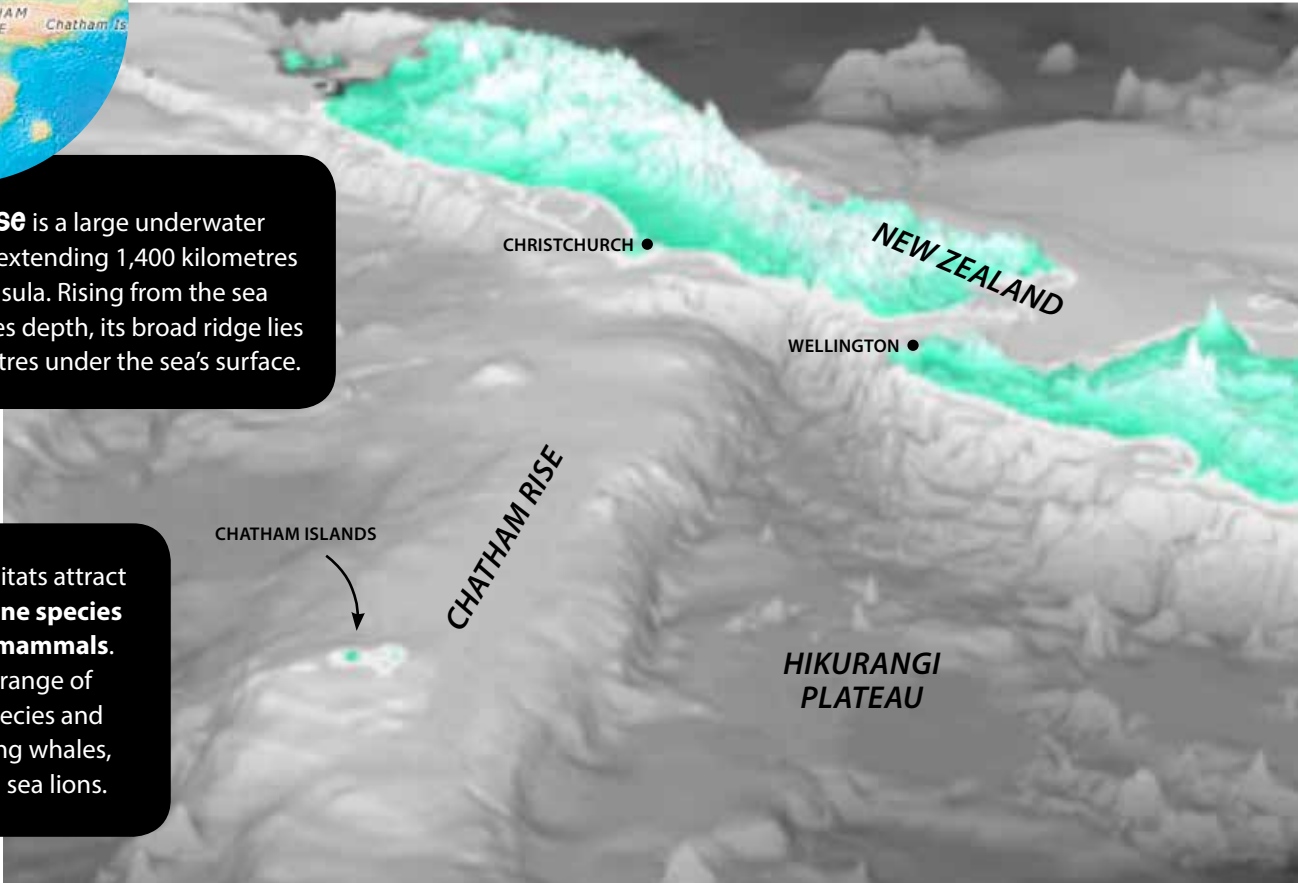


90 MILE BEACH

New Zealand has one of the **longest coastlines** and one of the largest marine areas in the world, compared with its land area.



The **Chatham Rise** is a large underwater **plateau** (flat land) extending 1,400 kilometres east of Banks Peninsula. Rising from the sea floor at 3,000 metres depth, its broad ridge lies some 350 - 400 metres under the sea's surface.



Diverse marine habitats attract **thousands of marine species including marine mammals**. New Zealand has a range of marine mammal species and subspecies, including whales, dolphins, seals, and sea lions.

## A selection of NZ's Marine Mammals



## Seascapes

A **seascape** is a 'view of the sea'. New Zealand has many different seascapes.



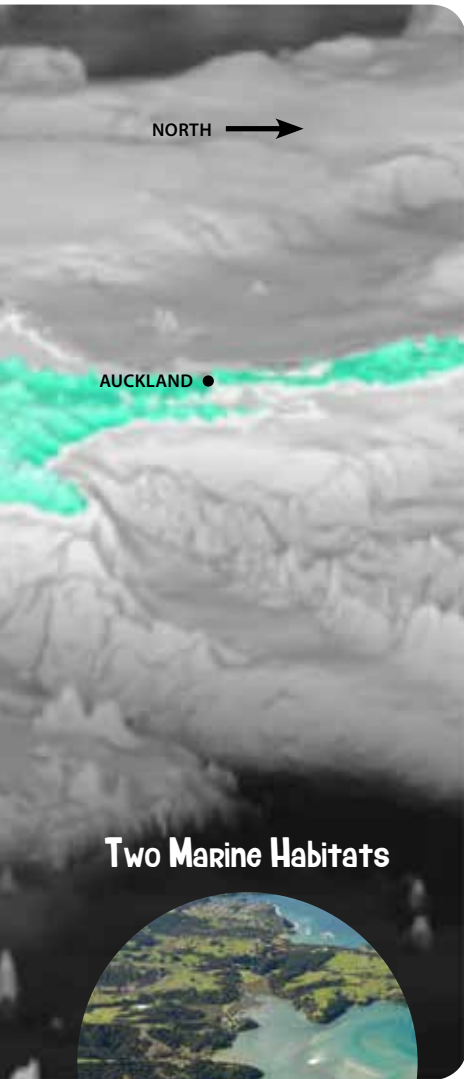
AKAROA HARBOUR - CANTERBURY



OKORITO - WEST COAST



ST KILDA - OTAGO



## Two Marine Habitats



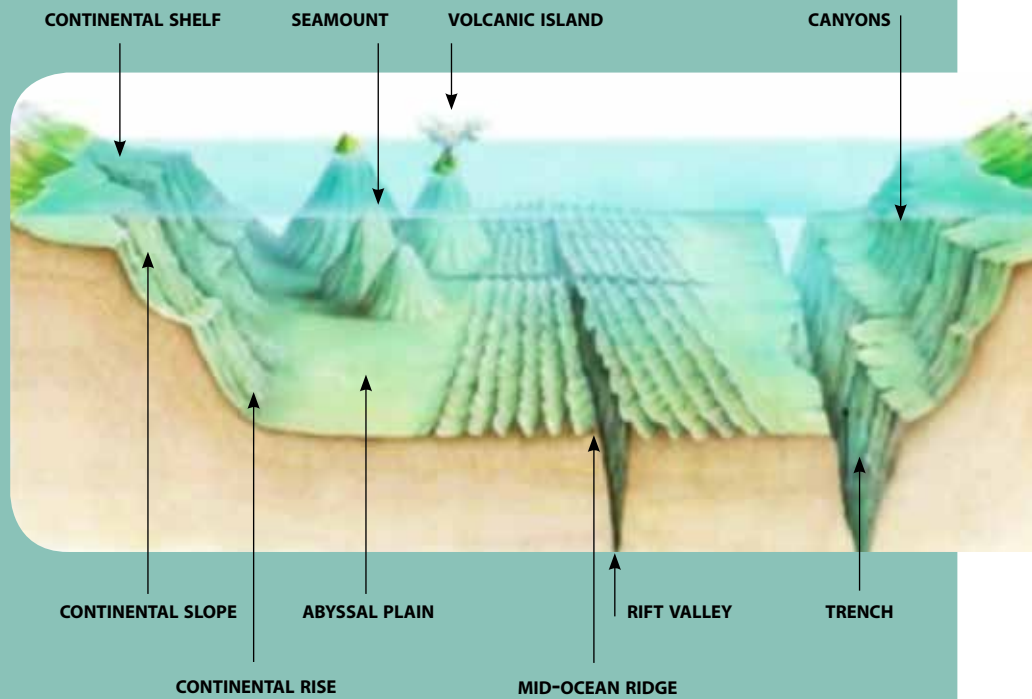
MANGROVES - WHANGATEAU HARBOUR



REEFS - KAIKOURA

New Zealand marine area has many diverse **marine habitats**, from saltmarsh and mangrove forests, to rocky coastal reefs, to deep sea trenches, canyons, undersea volcanoes, and seamounts.

## The Ocean Floor



Deep under the ocean, colossal mountains, and mountain ranges rise from the sea floor, their peaks far beneath the surface. The biggest are called '**seamounts**'. These underwater mountains are oases of life. Nutrient rich currents well up and swirl around their slopes feeding diverse and extraordinary **ecosystems**.

Ocean **trenches** are long, narrow hollows on the seafloor. They are the deepest parts of the ocean - and some of the deepest natural spots on Earth.

**Abyssal plains** are underwater areas of flat land on the deep sea floor.



For more information please visit our website: [www.blackcat.co.nz](http://www.blackcat.co.nz)