

NZ Curriculum:

Key competencies

Thinking; Managing Self; Relating to others

Science

Level 3: *The Nature of Science: Participating and contributing:* Use their growing science knowledge when considering issues of concern to them.

Level 4: *The Nature of Science: Participating and contributing:* Explore various aspects of an issue and make decisions about possible actions.

Level 5: *The Nature of Science: Participating and contributing:* Develop an understanding of socio-scientific issues by gathering relevant scientific information in order to draw evidence based conclusions and take action where appropriate

Geography

Level 6, 7, 8: Geographic research Contemporary New Zealand geographic issue Geographic topic at a global scale Application of geographic concepts

NZ Curriculum: Social Sciences

Level 3: Understand how people make decisions about access to and use of resources differently

Level 4: Understand how producers and consumers exercise their rights and meet their responsibilities.

Level 5: Understand how people's management of resources impacts on environmental and social sustainability

This resource can also be used to support the teaching of Achievement Objectives in:
Te Reo Māori Maths English Technology

LEARNING OBJECTIVES:

- LO1 Understand that fishing can impact habitat and non target species (and understand that these impacts must be minimised for fish to receive the MSC Blue Fish Tick)
- LO2 Describe how Tāiko (Black Petrel) are impacted by fishing
- LO3 Identify one or more fishing methods; the type of fish they might catch and from which habitat
- LO4 Investigate how one or more fishing methods impact on marine habitats and non target species
- LO5 Identify how fishing methods can be modified or new methods created to reduce bycatch & impacts on habitats
- LO6 Use scientific and fishery related vocabulary

POSSIBLE WONDERINGS:

- How would I feel if I caught a marine creature (like a sea gull or ray or shark) by mistake?
- What does the seafloor look like before and after dredging?
- What other clever ways can we come up with to reduce environmental impacts?
- When we go fishing, what can we do to reduce our impact?

Te Marautanga o Aotearoa

Pūtaiao Level 4+: Uses of Science

Level 4+: Philosophy and History of Science

Level 4+: The Natural World

Tikanga-ā-iwi

Level 4+: Kotahi tonu te matua o te tangata Māori, ko Ranginui e tū nei, ko Papa-tū-ā-nuku e takoto nei. (Place and Environment)

Level 4+: E tama, e hine, tangata i ākonga ki te whare, tū ana ki te marae, tau ana (The Changing World)

Level 4+: E kore e ngaoko te rākau ki te tīkina i te pūtake whakangaoko ai engari, me tiki ki te matamata (The Economic World)

Hauora Level 3+: Relationships to earth and sky (natural environments)

CONCEPTUAL UNDERSTANDINGS:

1. Fishing can impact habitat and non target species (but Marine Stewardship Council certified fisheries are assessed to a standard ensuring impacts on marine habitats and species are minimised (Principle 2)) (LO1)
2. Tāiko (Black Petrel) are impacted by fishing as they are sometimes caught as bycatch (LO2)
3. A variety of methods are used to catch fish and different methods suit different species and environments (LO3)
4. Different fishing methods impact marine habitats and non target species in different ways (LO4)
5. Fishing methods can be modified and new methods developed to minimise impacts on marine habitats and non target species (LO5)
6. Specialised words & terms are used in fishery management and science (LO6)

POSSIBLE ACTIONS:

- THINK about what we can do to avoid catching non target species when fishing
- LOOK for the Marine Stewardship Council label when I buy fish
- ASK whānau at home about their fishing and how they avoid bycatch
- SHARE new knowledge with whānau at home
- MAKE a poster/ imovie/ game/ presentation informing an audience about bycatch and the role of the Marine Stewardship Council

LEARNING EXPERIENCES OVERVIEW



LESSON 1: Fishing Methods FOCUS QUESTION: *What methods are used to catch fish? What fish are caught and from which habitat?*

- Take a moment to CONSIDER what fishing methods have you used? Have you ever caught a marine animal that you didn't mean to catch? What happened? How did you feel? [[slide 8](#)]
- READ and ANSWER questions about fishing methods using the [Fishing Method Worksheet](#) [[slide 9](#)]
- MATCH fishing method images to method names [[slide 10](#)]
- EXPLORE different fishing methods and WATCH short film clips illustrating each of the different methods [[slides 11-25](#)]
- PLAY the [Tricky Trawling Game](#) [[slide 14](#)]
- TEST knowledge and MATCH fishing method descriptions with picture of fishing gear and habitat/species caught cards [[slide 26](#)] [[See Teacher Outline & Fishing Method Cards](#)]

LESSON 2: Environmental impacts of fishing [Principle 2] FOCUS QUESTION: *How does fishing impact habitat and non-target species?*

- EXPLORE how fishing can affect the marine environment (habitat and endangered species) [[slides 27 - 29](#)]
- WATCH the short film about [marine habitat and species protection](#) [2:11] [[slide 27](#)]
- WATCH the short film about [bycatch](#) [1:00] [[slide 30](#)]
- INVESTIGATE the relationship between bycatch and different fishing methods and play the [Bycatch in a Bucket Game](#) and / or explore the [Bycatch Field Trip Activities](#) [[See Teacher Outline](#)] [[slide 30](#)]
- CREATE your own Bycatch game using [Scratch](#) [[slide 30](#)]

LESSON 3: Tāiko (Black Petrel) as bycatch FOCUS QUESTION:

How are Tāiko (Black Petrel) impacted by fishing?

- EXPLORE the ecology and migration path of Black Petrel [[slide 31](#)]
- WATCH two short films. The first is about the [ecology and migration of Black Petrels](#) and the second about [commercial fishers from Moana New Zealand helping to look after the Black Petrel](#) [4:07] [[slide 32](#)]
- INVESTIGATE Tāiko as bycatch – including where and how often they are caught [[slide 33](#)] and recent capture data [[slide 34](#)] by completing [Bycatch Data Worksheet](#)
- EXTEND learning by conducting an outdoor EXPERIMENT to see how successfully colourful ribbons deter birds and graph the results [[Teacher OUTLINE](#)]
- WATCH young [ocean explorers encounter with Tāiko and False Killer Whales](#) [5:32] [[slide 34](#)]

LESSON 4: Reducing impacts: New & Modified fishing methods FOCUS QUESTION: *How are fishing methods developed and modified to reduce impacts on habitat and sea life? & Reviewing key concepts FOCUS QUESTION: *What have we learnt?**

- WATCH the short film from Seafood New Zealand about [Innovation – We're Fishing Smarter](#) [4:45] and ANSWER the questions [[slide 35](#)]
- INVESTIGATE Tiaki Precision Seafood Harvesting (PSH) as an example of a new fishing method that reduces the impact of fishing on the environment by reducing bycatch [[slide 36-37](#)]
- WATCH the short films [[there are three links on slide 37](#)] illustrating [how this fishing method works](#) [[slide 37](#)]
- EXPLORE how the Marine Stewardship Council works to help reduce bycatch by reading the [Beating Bird Bycatch story](#) [[slide 38](#)]
- Re-WATCH the short film about [marine habitat and species protection](#) [2:11] and complete the [Write a story WORKSHEET](#) to WRITE a script using images from this short film clip to make a booklet about Marine Stewardship Council's Principle 2 [[slide 39](#)] [[Teacher Outline](#)]

KEY WORDS AND CONCEPTS (FOR TEACHERS)

Pelagic	Open ocean
<u>Purse seine</u>	A large seine (fishing net) which may be drawn into the shape of a bag, used for catching shoal fish.
<u>Sustainable fishery</u>	A Sustainable fishery is a fishery that has been fished in such a way as to leave enough fish (from that fishery) in the ocean, respecting habitats and ensuring people who depend on fishing from that fishery can maintain their livelihoods.
<u>Longline</u>	A deep-sea fishing line from which are suspended many short lines with baited hooks
<u>Bycatch</u>	Unwanted fish and other marine creatures trapped by commercial fishing nets during fishing for a different species
Demersal	Close to the floor of the sea or a lake. Demersal fish are bottom feeders.
<u>Dredging</u>	Dredging is a fishing method in which a dredge is dragged across the sea floor, either scraping or penetrating the bottom.
<u>Fishing method</u>	Techniques used to catch fish!
Target species	The species (or group of species) which is primarily sought in a fishery.
Habitat	The natural home or environment of an organism.
Non-target species	Species that are caught incidentally in a fishery, other than those primarily sought in a fishery.
<u>Trawl</u>	Trawling is a method of fishing that involves pulling a fishing net through the water behind one or more boats.
<u>Certification</u>	MSC certification is a way of showing that a fishery meets international best practice for sustainable fishing. Fish and seafood from certified fisheries can carry the blue MSC label, assuring customers that what they're buying is sustainable.