BYCATCH FIELD TRIP

HOW TO USE?

This activity aims to provide learners with first-hand experience of how hard it is to catch the target species, and to compare efficiency and bycatch for several different fishing methods. For more information about bycatch and habitat damage see slides sets.

See Teacher Outline for context and slide set Environmental Impact of Fishing for supporting slides and information.

FOCUS QUESTIONS

- *How can fishing impact habitat and non-target species (and do these impacts need to be minimised for fish to receive the MSC Blue Fish Tick?)?*
- *What impact do different fishing methods have on marine habitats and non-target species?*

MATERIALS

- Bait catchers (set up with lanyard, bait, weight) (one per group)
- Nets (with different sized mesh)
- Buckets (one per group)
- Shade cloth (wet tea towel or umbrella)
- Timer
- Copies of the worksheet
- Clip board and pencil
- ID Books for your local area

TEACHER PREPARATION

- Find a local site to conduct the field trip. A local wharf would be ideal.
- Identify the species of fish to target. We suggest the Spotty *Notolabrus celidotus* also known as Paketi or Pakirikiri. This endemic species [native only to Aotearoa New Zealand] belongs to the wrasse family and can be found all around Aotearoa New Zealand. Triple fins or blennies would also be good. NOTE: We are targeting one fish species so learners get some [albeit over simplified] experience of how hard it might be to catch just the one species of fish they are targeting!
- Explain how to transfer fish from bait catchers and nets to buckets without harming fish. We don't want to harm or kill any sea creatures during this field trip! This Responsible Fishing Guide might be helpful.
- We have set the fishing time at 5 minutes. It may take longer for the fish to pick up the scent of bait in which case you may need to extend to 10 minutes.

PROCEDURE

Part One (Pre-Trip: 15+ minutes)

1. Learners complete the prior knowledge chart.
2. Discuss species of fish targeted. Make sure learners can recognise the target fish. Explain what we will do on our field trip.
3. You could have learners complete 'Local Fish Fact Sheet: Spotty'. If you are targeting a different type of fish then use the 'Local fish Worksheet'.
4. Explain to learners that we will be using three different fishing methods and remind them that we don't want to harm any fish.
5. Have learners create a hypothesis about which type of fishing method will be most efficient at catching the target species, and which will result in most bycatch. Justify their thinking.
6. Discuss with learners different points of view about fishing and bycatch. These might include bycatch is acceptable as fishers need to make a living; people want to buy fish at a good price; not a single endangered species (including marine mammal or seabirds) should be sacrificed in the process of catching fish.
7. Have all learners in the class position themselves on a values continuum. At one end of the line are those who support the view that 'no bycatch is acceptable when fishing' and at the other end of the line are those who believe that 'bycatch is an acceptable and inevitable part of fishing'. Justify your position!

Part Two (In the field: 60+ minutes)

1. Once at the site, break learners into small groups.
2. Each group needs to
    a. Complete the top two rows of the field trip data sheet.
    b. Set up a bait catcher [add bait such as buttered bread, one or two small fishing weights and securely tie a lanyard or line to the catcher].
    c. Fill a bucket with seawater and ensure it is in the shade or shaded by a shade cloth / umbrella [this is a safe haven for any creatures caught by the group].
    d. Gently lower the catcher into the sea.
    e. Start the timer.
    f. Leave the bait catcher in the water for exactly five minutes then retrieve.

g. Carefully put the catcher in the bucket of water and open to allow any fish or other sea creatures to escape.

h. Use the data sheet provided [see final pages] to record what was caught.

3. Repeat the process using each fishing method. Spend exactly five minutes trying to catch fish using each method. Transfer fish to the bucket and be sure to record results. [NOTE: You could have each group complete the exercise using one method only. Then have them compare and share their findings with each other].

4. Once complete, gently release all creatures back to the sea!

Part Three (Post field trip: 50+ minutes)

1. Review and evaluate. What did we learn? What more do we want to learn…?

2. Talk about fishing effort i.e., how long we spent fishing [5 minutes for each method] and fishing efficiency. Did one method yield better results for the target species than the others? If you were a commercial fisherman targeting this species which method, would you use? Why? Remember time = money! And fishing needs to be economically sustainable.

3. Talk about the Marine Stewardship Council's principle two for sustainable fisheries and consider the fishing methods that you have just used:

   i. Bycatch: Was it easy to just catch the targeted fish or was there bycatch? Was it easy to catch the required amount (one fish)? What percent of bycatch were released unharmed?

   ii. Habitat damage: Was there any damage to the environment?

   iii. Fishing method: What would be the likely impact of other methods? Was ours the best method? How could you modify the methods to reduce bycatch? How could you modify the methods to reduce habitat damage?

4. Collate and graph findings from your group (i) Create a bar graph showing the number of target species caught using each method. (ii) Create a bar or pie chart showing the bycatch for each method.

5. Extension: Combine the class results and repeat (i) and (ii).

KEY WORDS

Bycatch

Fishing method

Target species

Habitat

Non-target species

CURRICULUM LINKS

Nature of Science (Level 3-5)

- Investigating in science
- Communicating in Science
- Participating and Contributing

Living World (Level 3-5)

- Ecology

Science (Level 6)

- Ecology
- Participating and Contributing

Social Studies (Level 3-5)

- Understand how people make decisions about access to and use of resources (Level 3)
- Understand how people's management of resources impacts on environmental and social sustainability (Level 5)

Geography (Level 6, 7, 8)

Relevant achievement standards related to:

- Geographic research
- Geographic issue of a global scale
- New Zealand contemporary issue
- Geographic concept: Sustainability

Technology

- Nature of technology

Maths (Level 3-5)

- Statistics

Pūtaiao

- The Natural World: The Biological Environment: Investigate the effect of human actions, and natural processes, on an Aotearoa ecosystem (Level 6)

PRIOR KNOWLEDGE CHART

BYCATCH & HABITAT DAMAGE		
What we know	**What we would like to know**	**What we have learned**

SAMPLE FIELD TRIP DATA SHEET

Your name(s):	Date & time:	Site location:
Aroha Jones & Finn Taniwha	13th May 2025 @ 10.20am	Panea Wharf

High tide today is at:	Name of target fish:
10.43 AM	*Notolabrus celidotus* (Spotty)

FISHING METHOD 1: Bait catcher

Total time taken using this method: 5 minutes

Type of creature / species if known	# caught	Other notes [e.g. f / m]
Shell fish [Cats eye]	x 2	
Fish [Triple fins]	x 4	
Fish [Spotty]	x 1	female
Octopus	x 1	(baby?)

FISHING METHOD 2: Mesh net (10mm mesh size)

Total time taken using this method: 5 minutes

Type of creature / species if known	# caught	Other notes [e.g. f / m]
Fish [Triple fins]	x 2	
Fish [Spotty]	x 3	female

FISHING METHOD 3: Mesh net (90mm mesh size)		
Total time taken using this method: 5 minutes		
Type of creature / species if known	# caught	Other notes [e.g. f / m]
Fish [Spotty]	x 1	female

FIELD TRIP DATA SHEET

Your name(s):	Date & time:	Site location:
High tide today is at:	Name of target fish:	

FISHING METHOD 1:		
Total time taken using this method:		
Type of creature / species if known	# caught	Other notes [e.g. f / m]
FISHING METHOD 2:		
Total time taken using this method:		
Type of creature / species if known	# caught	Other notes [e.g. f / m]

FISHING METHOD 3:		
Total time taken using this method:		
Type of creature / species if known	# caught	Other notes

		[e.g. f / m]