

### Lesson Summary

Overfishing is emptying the ocean, with 90% of fisheries already overfished. Illegal fishing is increasing this. In this lesson we will look at some of the fishing practices being and the impacts on the ocean and marine wildlife, and some methods used to stop by-catch.

This lesson will take approx. 45 mins.



### Subjects relevant to

English, Geography, History, Math, Science and Social Science.

### Learning objectives

From this lesson students will:

- Learn about the types of fishing methods and equipment used.
- Consequences of fishing industry – lost and discarded fishing nets.
- Understand and evaluate methods available to stop by-catch.

### Preparation

- This lesson has been designed to provide a complete lesson, but can be stopped at any time and split over multiple lessons, should you wish to include your own discussion/questions or incorporate the lesson activities.
- Definitions of key terms have been provided at the end of the guide to assist with the learning process.
- Each lesson has case study options showing Sea Shepherd campaigns, including videos to provide students with a firsthand experience of ocean conservation in action.
- Depending on whether students are working in a classroom or remotely, you can choose to discuss questions in the class or use the online learning app.
- This digital lesson has an interactive option called student devices. If you choose this option ask the students to bring their mobile phones or tablets to the lesson.
- Should you choose the interactive option, it will run a quiz during the lesson. Recommendation: only use this interactive option in classes of up to 30 students.
- Students can sign up on their mobile device to the [www.LessonUp.app](http://www.LessonUp.app). They will be asked for a PIN code (this will appear automatically on slide 3 and will also show at the bottom of the screen). Students who sign up under a false name may be removed by the teacher.
- Students who do not have a mobile device can join the quiz with another student.
- If student devices is turned ON, you can opt to turn the sound and the share screen ON or OFF. Further on you can choose if you want to 'show ranking after each quiz' question. Doing so will create a competitive element, but it can be distracting. Recommendation: turn the 'show ranking after each quiz' OFF.
- The abovementioned options will also show if you click on the PIN code at the bottom of the screen.

## Lesson plan

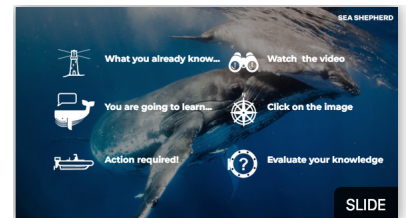
### Slide 1 Introduction

This lesson is provided by Sea Shepherd. Sea Shepherd was founded in 1977 and is a marine conservation organisation working to protect the oceans and marine wildlife. Sea Shepherd works globally on a range of issues impacting the oceans, running numerous direct action campaigns each year. IUU is one area Sea Shepherd is working on to help stop illegal fishing and reduce by-catch.



### Slide 2 Lesson action icons

During the lesson we will use these icons to identify the learning actions.



### Slide 3 Lesson summary

During this lesson we will further explore IUU fishing activity, by looking at some of the fishing methods being used and discuss their impacts.



### Slide 4 Overfishing

This slide shows an emptying ocean. Explain to students that scientists estimate that by 2050 the ocean eco-system will be on the verge of collapse, empty of fish and marine wildlife, unless urgent action is taken on the issues impacting on the oceans and marine wildlife.

**INTERACTIVE JOIN** – ask students to go to [www.LessonUp.app](http://www.LessonUp.app)



### Slide 5 Previous lesson summary

During the previous lesson we talked about some of the practices being used to protect the ocean and ways that law enforcement are detecting illegal fishing activity.

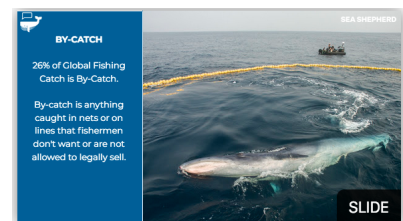
Now we are going to look at some of the implications of how fishing is taking place, both by legal and illegal fishing operations that are contributing to overfishing.



### Slide 6 By-catch

It is estimated that around 26% of the global fishing catch is by-catch. By-catch is basically anything that is caught in fishing nets or on lines that the fishermen don't want or are not allowed to legally sell.

Generally they remove the by-catch from the nets and return it to the ocean. However many of these animals will have already died before they are freed. By-catch could be other species of fish, turtles, dolphins, sharks or even whales.



### Slide 7 Why does by-catch occur

The nets used for commercial fishing are so large that they capture everything in their wake and are down for long periods of time. So while the fishermen may be targeting large schools of a particular fish species they will catch everything else in the area at that time. It is simply a by-product of bigger catches, which means more money in less time.



### Slide 8 Toll on marine wildlife

Commercial fishing operations for example are responsible for killing some 300,000 dolphins and whales as by-catch each year and 250,000+ loggerhead and leatherback turtles.



### Slide 9 Purse Seine Fishing

The purse seine tuna fishing industry has for many years had an issue with high by-catch levels. For example yellowfin tuna will school with adult skipjack, meaning both will be caught in their nets. The survival of the tuna relies on fishermen processing and removing the unwanted tuna species from the nets. From the earlier lesson we discussed the issue of unreported fishing catches. By-catch is one area that is often underreported.





### Slide 10 Intentional by-catch

One practice that the commercial fishing industry has been caught doing is intentionally trapping whales or whale sharks, knowing that other fish are feeding along side them.

Gabon is one country that outlaws this practice.

Show the video (3.00mins) from Sea Shepherd's Operation Albacore which shows some examples of the marine wildlife in Gabon and the issue of by-catch.

<https://www.youtube.com/watch?v=cnm-T0GiuSY&list=PLx1pnhQVtbbBnH1BBXzQtknEROG73UNO9&index=3>



### Slide 11 Protecting marine wildlife

To help tackle the issue of by-catch a number of practices have been developed and if properly used can help save the lives of marine wildlife.

These include:

#### Monitoring catch and releasing

Many countries require fishing operators to have crew that specifically spot for whales, dolphins, turtles and remove them from nets before they die.

#### Turtle Excluder Device (TED)

TED's are grates attached to the mouths of shrimp trawl nets that keep sea turtles and other marine wildlife out of the nets. It is a requirement for some industries that these must be fitted.

#### Fishing practices to deter marine birds

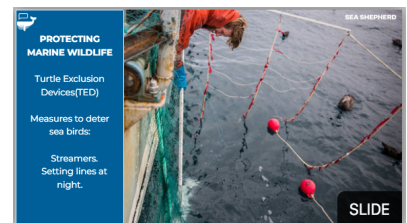
Many sea birds have been impacted by the growth of the long-liner fishing industry, where lines with hundreds of hooks are put out from the backs of fishing vessels. The birds are snared as they chase the baited hooks. With hundreds of sea birds dying action was required.

The Agreement on Conservation of Albatross and Petrels (ACAP) was established to coordinate international activity to reduce the threats to the populations of species at risk, such as albatrosses and petrels.

ACAP aims to reduce the impacts of fishing on seabirds and changing fishing practices. This has included:

- Reducing the time the baited hooks are available to birds to target before they sink into the water,
- Using methods to deter birds coming close, such as streamers, and
- Setting lines at night time, when birds are not around.

While this has reduced the threat to sea birds it does not eliminate the risk completely.





### Slide 12 Scale of industrial fishing

The increasing demand for fish and a desire to make it cost effective saw the development of large scale industrial fishing vessels during the mid 1900's. The vessels and nets were developed to dramatically increase the size of the fishing catch.



### Slide 13 Size of nets

This resulted in large increases in the size of the nets being used and changes to the size of the mesh in the nets. Over the years the mesh size has decreased allowing smaller sized fish to be caught. Fish that could once swim through a net, like younger fish, are now being caught in the massive nets.

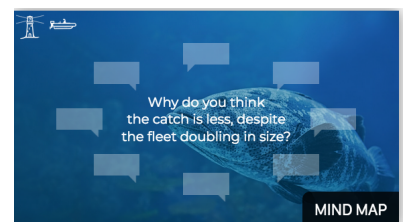


### Slide 14 Question

Since 1950's the commercial fishing fleet has doubled, but is catching less.

Ask students answer via [www.LessonUp.app](http://www.LessonUp.app) or discuss in classroom:

"Why do you think the catch is less, despite fishing fleets doubling in size?"

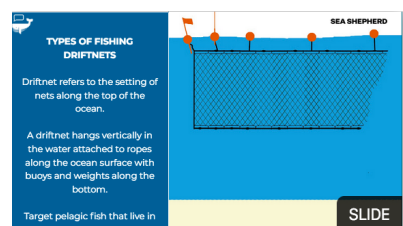


### Slide 15 Types of fishing - Driftnets

There are numerous types of fishing styles and gear that are used to catch different species.

Driftnet refers to the setting of nets along the top of the ocean. A driftnet is not anchored to the ocean floor, instead it hangs vertically in the water attached to ropes along the ocean surface with buoys and weights along the bottom. These nets are used to target pelagic fish, which simply means fish that are not in coastal waters, reefs or on the sea-bed. They live in open ocean and can be several kilometres under the surface.

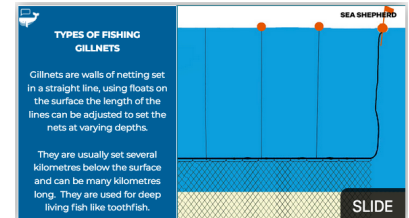
Illegal poachers are often caught using illegal driftnets. In December 1991 the United Nations General Assembly approved a resolution banning the use of driftnets longer than 2.5kms in international waters, commencing from 1993. Yet over 25 years after the resolution poachers are still using driftnets. These types of nets are very destructive as they trap everything in their path.



The Sea Shepherd Case Study – Operation Driftnet provides further information on this type of fishing.

### Slide 16 Types of fishing - Gillnets

Gillnets are walls of netting set in a straight line that are very effective at trapping fish. Using floats on the surface the length of the lines can be adjusted to set the nets at varying depths. They are usually set several kilometres below the surface and can be many kilometres long. They are used for deep living fish like toothfish. Laws on gillnets vary between countries.

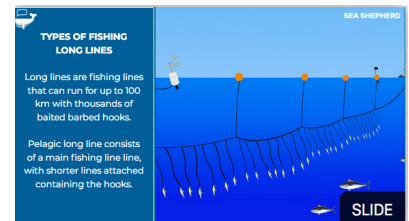


The Sea Shepherd Case Study – Operation Iceshield provides further information on this type of fishing.

### Slide 17 Types of fishing - Long line fishing

Long lines are fishing lines that can run for up to 100 km (62.1 miles) with thousands of baited barbed hooks. They will catch everything that tries to go for the bait or any fish caught on the hooks, this includes sharks, seals or turtles.

These lines are also dangerous to sea birds, who will try to dive and take the bait from the hooks or the fish caught on them.



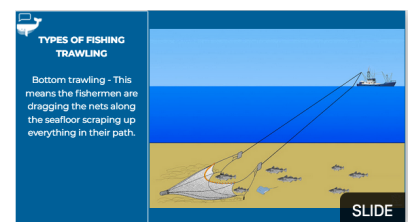
There are two types of long lines, both consist of a main fishing line from which shorter lines containing hooks:

- pelagic long line uses normal fishing line for the main line.
- cable long line uses a heavy wire line for the main line.

### Slide 18 Types of fishing - Trawling

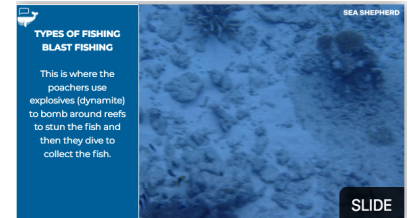
There are two main types of trawling, the main one being bottom trawling.

Bottom trawling - This means the fishermen are dragging the nets along the seafloor scraping up everything in their path. This method brings up with them all life and the habitat, this includes corals and sponges along with the fish, jellyfish, starfish and anything else in their path. Any fish of reasonable size is sold separately the rest is called 'trash fish' and is sent to be turned into fishmeal which can be used for food in fish farms, like prawn farms. Bottom trawling is very destructive, wiping out habitat and ecosystem all in one go.



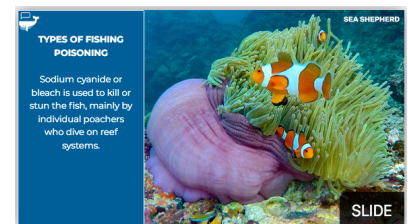
### Slide 19 Types of fishing – Blast fishing

This is where the poachers use explosives (dynamite) to bomb around reefs to stun the fish and then they dive to collect the fish. Using this method also destroys the reef itself by killing corals. This method is illegal, but has been used in places like Tanzania and Indonesia.



### Slide 20 Types of fishing - Poisoning

Sodium cyanide or bleach is used to kill or stun the fish, mainly by individual poachers who dive on reef systems. This highly toxic chemical is mixed up in a bottle, which is then used to squirt the chemical in the area of a reef that the poachers intend to stun the fish. The chemical coats the reef and any other fish near by. Too high a dose and it will kill the fish. This method is mainly used around tropical coral reefs to stun and capture tropical fish for aquariums.



### Slide 21 Types of fishing – Fish Aggregating Devices

These devices are designed to lure fish into an area to make it easier to find and catch fish. The device can attract multiple species of pelagic (open water) fish.

Small fish use the floating debris to hide from larger fish in the open ocean. Larger fish are also attracted and visit the debris in search of an easy meal.

There is no regulatory system in place to monitor the deployment and tracking of these devices. These are used widely in the tuna fishing industry and usually consist of a buoy or floats attached to the device, which is tethered to the ocean floor to keep it in one location.



### Slide 22 Abandoned, lost and discarded fishing gear

Abandoned, lost and dumped fishing nets, both from legal and illegal fishing vessels, can become ghost nets. Floating walls of death that have a huge impact on marine wildlife.





### Slide 23 Plastic ghost nets

Ghost nets are made from plastics, which can float in the oceans for many years trapping any marine wildlife that come in contact with them. Some nets are made from materials that make them hard to detect underwater, which is why they are effective fishing tools, but as ghost nets they just become death traps for anything and everything.

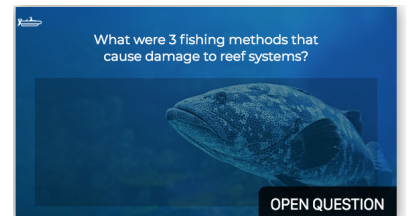
*For more information on this topic see the lesson Abandoned, Lost and Dumped Fishing Gear.*



### Slide 24 Question

Ask students to answer via [www.LessonUp.app](http://www.LessonUp.app) or discuss in classroom.

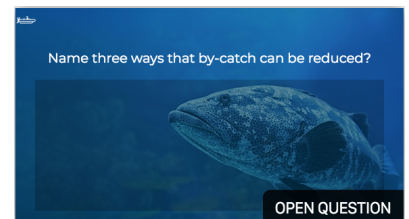
“What were 3 fishing methods that cause damage to reef systems?”



### Slide 25 Question

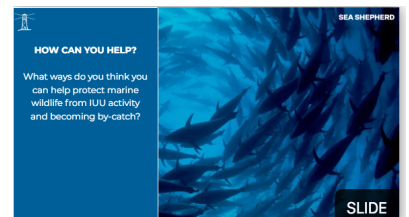
Ask students to answer via [www.LessonUp.app](http://www.LessonUp.app) or discuss in classroom.

“Name 3 ways that by-catch can be reduced?”



### Slide 26 How can you help protect marine wildlife?

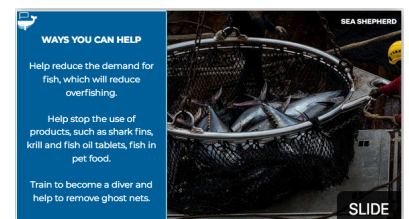
We have discussed this in previous lessons, but having studied the three lessons ask students to list ways they can help tackle the issues of overfishing, IUU activity and by-catch.



### Slide 27 How can you help protect marine wildlife?

Some ideas might be:

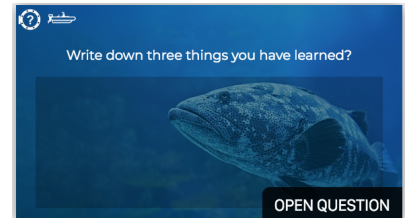
- Help reduce demand for fish, which will reduce overfishing.
- Stop using fish products – shark fins, krill, pet foods.
- When old enough train to dive and help remove ghostnets



### Slide 28 What did you learn?

Ask students to answer the following question using [www.LessonUp.app](http://www.LessonUp.app) or discuss in the classroom.

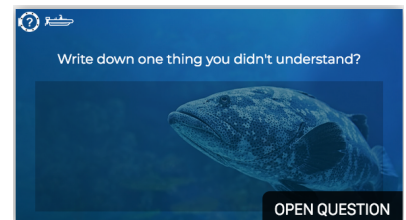
“Write down three things you have learned?”



### Slide 29 What don't you understand?

Ask students to answer the following question using [www.LessonUp.app](http://www.LessonUp.app) or discuss in the classroom.

“Write down one thing you didn't understand?”



### Slide 30 Summary of key facts

90% of the global fisheries have been overfished.

30% of global commercial fishing catch is taken illegally.

26% of catch is by-catch.

By 2050 the ocean ecosystem will collapse if we don't stop overfishing.

Everyone can help make this happen by reducing the demand for fish and more wisely using the fish that is caught.



### Slide 31 Case Studies

Sea Shepherd Case Studies cover a number of Sea Shepherd campaigns and show video of some of our work to stop IUU fishing activity, working with law enforcement officials around the world. These can be used to enhance the learning experience from these lessons.





# ILLEGAL, UNREPORTED AND UNREGULATED (IUU) FISHING LESSON 3

TEACHERS GUIDE: PRIMARY SCHOOL (Age 8 – 11)

[Slide 32 Close](#)



## Case Study Options

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- Case Study – Operation Albacore
- Case Study – Operation By-catch
- Case Study – Operation Driftnet
- Case Study – Galapagos Island
- Case Study – Operation Icefish
- Case Study – Operation Milagro
- Case Study – Operation Siso
- Case Study – Operation Sola Stella



### Key Definitions

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IUU – Illegal Unreported and Unregulated Fishing.

Illegal fishing - means that the fishermen enter the territorial waters of a country or regulated marine zone without permission or without a license for the fish they intend to catch.

Unreported - means that a fishing vessel may have a license with an allocated quota for fishing a particular species, such as tuna, but then catches more than their quota states and without reporting the extra catch.

Unregulated - refers to areas where there may not be a quota or any regulations in place, either in that location or for the type of species.

By-catch - is basically anything that is caught in fishing nets or on lines that the fishermen don't want or are not allowed to legally sell.

Ecosystem - a biological community of interacting organisms and their physical environment.

Extinction - the state or process of being or becoming extinct. No longer in existence.

FAD – Fish Aggregating Device. Aggregating means to form or group into a cluster.

Overfishing - depletion of fish numbers by excessive fishing.

Overfished populations - depleted the numbers of fish in specific area) by excessive fishing. Even though these numbers could still be considered sustainable, they could ultimately lead to the collapse of fisheries.

Poaching - illegally hunt or catch (marine mammals or fish) that is not one's own or in contravention of official protection.

TED – Turtle Exclusion Device.

### YOUR FEEDBACK

We value your feedback and would be pleased to hear your thoughts about this lesson and activities. Any comments, suggestions or requests for further information can be sent to [education@seashepherdglobal.org](mailto:education@seashepherdglobal.org).