



# Macroplastics: a threat to wildlife

Biology - Module 1

# Biology Module 1

## Macroplastics: a threat to wildlife

### Introduction

This is the first module for the Biology section of Unplastic. It focuses on Macroplastics and includes an in-class activity. The guide and activity are designed to be used in tandem with the slides available on this website. The slides include ample supplemental information for each section in the presenter's notes.

In this module, we explore how wildlife and macroplastics interact in numerous ways. We showcase different types of interactions (entanglement and ingestion), examine the difference between acute and chronic exposure, and discuss lethal and sublethal effects. We also discuss examples of proposed solutions to ocean macroplastic pollution and assess the strengths and weaknesses of one of these solutions through a debate. In this module, we address the following key questions: How are marine and terrestrial wildlife impacted by macroplastics? How does macroplastic pollution interact with wildlife? What kind of effects can be observed in animals?

### Key Concepts

- I. Macroplastics
- II. Entanglement
- III. Ingestion
- IV. Chronic exposure
- V. Acute exposure
- VI. Lethal effects
- VII. Sublethal effects

## Learning Outcomes

At the end of the module, students are able to:

- I. Understand the impact of macroplastic pollution on wildlife
- II. Describe the types of interactions between macroplastics and wildlife (entanglement, ingestion).
- III. Discuss the different types of exposure (acute, chronic) in the context of macroplastics and wildlife.
- IV. Discuss the different types of effects (lethal, sublethal) that macroplastics have on wildlife.

## Glossary

| Term               | Definition                                                                                                                  |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Macroplastics      | A plastic particle with a size greater than 5mm                                                                             |
| Entanglement       | Being caught in macroplastics which can lead to decreased or impaired movement, possibly causing the loss of a limb or life |
| Ingestion          | The introduction of macroplastics into the digestive system                                                                 |
| Cumulative Effects | The combined impact of different effects                                                                                    |
| Chronic Exposure   | Constant, long term exposure                                                                                                |
| Acute Exposure     | Short term exposure                                                                                                         |
| Chronic Effects    | Effects that develop slowly due to long and continuous exposure to macroplastics.                                           |
| Acute Effects      | Effects that develop rapidly during short-term exposure to macroplastics.                                                   |
| Lethal Effects     | Something that causes or induces death                                                                                      |
| Sublethal Effects  | Something that does not cause death, but does reduce individual fitness (influenced size, growth, reproduction, etc)        |

## Quiz Questions with sources

### Question

What is the most prevalent source of plastic pollution in the oceans?<sup>1</sup>

### Answer

Food Packaging

☒ Fishing gear

Straws

Electronics

### Question

The EU has made a directive on single-use plastic that every member state has to comply with by 3 July 2021. What does it include?<sup>2</sup>

### Answer

☒ A ban for all single-use plastics with sustainable alternatives

☒ Reducing consumption through raising awareness

☒ Introducing extended producer responsibility schemes

☒ Labelling requirements that should inform the consumer of the plastic content of product

### Question

At least how many species of marine animals have been documented consuming plastic?<sup>3</sup>

### Answer

60

120

☒ 180

240

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<sup>1</sup> Laville, Sandra. "Dumped Fishing Gear Is Biggest Plastic Polluter in Ocean, Finds Report." The Guardian, November 6, 2019.

<http://www.theguardian.com/environment/2019/nov/06/dumped-fishing-gear-is-biggest-plastic-polluter-in-ocean-finds-report>.

<sup>2</sup> European Commission. 'Single-Use Plastics', n.d.

[https://ec.europa.eu/environment/topics/plastics/single-use-plastics\\_en](https://ec.europa.eu/environment/topics/plastics/single-use-plastics_en).

<sup>3</sup> Gabbatiss, Josh. "Why Marine Animals Can't Stop Eating Plastic." Our Blue Planet. Accessed March 4, 2021.

<https://ourblueplanet.bbcearth.com/blog/?article=why-do-marine-animals-eat-plastic>.

**Question**

How many seabirds are killed each year due to plastic debris in the ocean?<sup>4</sup>

**Answer**

Over 500,000

☒ Over 1 million

Over 3 million

Over 5 million

**Question**

By what year will there be more plastic than fish in the world's oceans?<sup>5</sup>

**Answer**

2025

☒ 2050

2075

2100

**Question**

WWF, together with a few other NGOs, called for a UN treaty on plastic pollution. How many signatories supported this?<sup>6</sup>

**Answer**

500,000

1 million

1.5 million

☒ 2 million

**Question**

How much plastic do Laysan Albatrosses feed their chicks each year?<sup>7</sup>

<sup>4</sup> United Nations Educational, Scientific and Cultural Organization. "Facts and Figures on Marine Pollution." Accessed February 21, 2021.

<http://www.unesco.org/new/en/natural-sciences/ioc-oceans/focus-areas/rio-20-ocean/blueprint-for-the-future-we-want/marine-pollution/facts-and-figures-on-marine-pollution/>.

<sup>5</sup> Kaplan, Sarah. "By 2050, There Will Be More Plastic Than Fish in the World's Oceans, Study Says." Washington Post, January 20, 2016.

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<sup>6</sup> WWF, the Ellen MacArthur Foundation and BCG, 2020. The business case for a UN treaty on plastic pollution.

<sup>7</sup> Laysan Albatross, n.d. [https://www.fws.gov/refuge/Midway\\_Atoll/wildlife\\_and\\_habitat/Laysan\\_Albatross.html](https://www.fws.gov/refuge/Midway_Atoll/wildlife_and_habitat/Laysan_Albatross.html).

**Answer**

5 milligrams

5 grams

5 kilograms

☒ 5 tons

## Resources

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