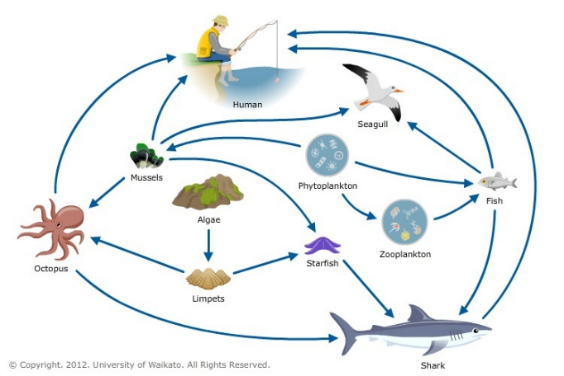
**Food webs in Aotearoa New Zealand’s marine environment – three-level reading** **guide**

**Ako: Learn about ecology and biodiversity**

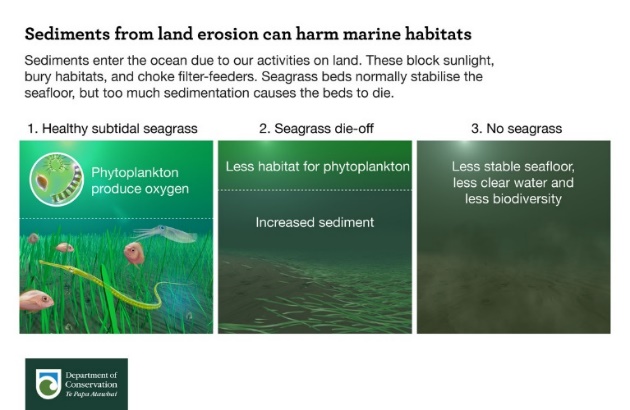
**Mahi: Read about marine food webs and use the information to answer the questions**

**Food webs in Aotearoa New Zealand’s marine environment**

Marine food webs in New Zealand’s waters are complex systems of interdependent species. At the base of the food web are phytoplankton, which are eaten by zooplankton. Small fish such as anchovies and pilchards consume zooplankton and are turn preyed upon by larger fish such as snapper, tuna and sharks. Apex predators like orcas and dolphins feed on these larger fish, and seals and sea lions also feed on fish but are not at the top of the food web as they are also preyed upon by orcas and sharks.

**Human activities**

Human activities can have significant impacts on the ocean food web. Overfishing of certain species can disrupt the balance of the food web and cause cascading effects. Pollution such as oil spills or agricultural run-off can harm species at all levels of the food web, from phytoplankton to apex predators. Climate change is also affecting the ocean food web, with warming waters and changes in ocean currents altering the distribution and abundance of species.

**Conservation efforts**

Conservation efforts such as marine protected areas and sustainable fishing practices are important for maintaining the health of the ocean food web. Reducing pollution and mitigating climate change can also help preserve the balance of the food web for future generations.

**Answer these three levels of questions**

***Level 1 – reading on the lines (kākano/seed)***

When reading ‘on’ the lines, you use/select factual statements from the text. The kākano/seed is being planted.

1. What is a marine food web?
2. What eats phytoplankton?
3. What is an apex predator?

***Level 2 – reading between the lines (tipu/shoot)***

When reading ‘between’ the lines, you use ideas that are suggested by the text. The tipu/green shoot of learning begins to grow.

1. What can happen if one species in the food web is overfished?
2. How does pollution affect the marine food web?
3. How is climate change affecting the marine food web?

***Level 3 – reading beyond the lines (puāwai/blossom)***

When reading ‘beyond’ the lines, you link ideas that are suggested in the text or from your own understanding of the topic. Learning comes to fruition/blooms/puāwai.

1. How can sustainable fishing practices support the health of the marine food web?
2. What is the role of marine protected areas in conservation?

1. How can individuals reduce their impact on the ocean food web?

**Mahi: Kupu hou**

Find and write down definitions for these words.

1. marine protected area
2. sustainable fishing practices
3. mitigate
4. phytoplankton
5. zooplankton
6. apex predator
7. overfishing
8. cascading effects

**Answers**

**Read about marine food webs**

1. What is a marine food web?

*A complex system of what eats what in the marine environment.*

1. What eats phytoplankton?

*Zooplankton eat phytoplankton.*

1. What is an apex predator?

*A predator at the top of the food web that has no natural predators.*

1. What can happen if one species in the food web is overfished?

*Overfishing disrupts the balance of the food web and causes cascading effects – for example, an overabundance of species caused by lack of predation.*

1. How does pollution affect the marine food web?

*Pollution has the potential to affect all parts of the food web – disruption in one part of the food web has impacts on other parts.*

1. How is climate change affecting the marine food web?

*Warming waters are affecting species habitats, which may cause disruptions within the food web.*

1. How can sustainable fishing practices support the health of the marine food web?

*Sustainable fishing helps support food webs because it stops people from taking too much of one species or not enough of another species.*

1. What is the role of marine protected areas in conservation?

*Marine protected areas are areas where no one can fish. Their role is to be a controlled area to cultivate species to avoid depletion or extinction.*

1. How can individuals reduce their impact on the ocean food web?

*By only taking the fish they need, reducing and recycling rubbish, informing others about the impacts they are having, standing up and creating change*.

**Kupu hou**

1. marine protected area

*Designated area in the ocean where human activities are restricted to protect and conserve the marine environment and biodiversity.*

1. sustainable fishing practices

*Methods of fishing that are environmentally responsible and can be continued indefinitely without depleting fish populations.*

1. mitigate

*To lessen or reduce the negative impact of something.*

1. phytoplankton

*Tiny plant-like organisms that form the base of the marine food web.*

1. zooplankton

*Small animals that feed on phytoplankton.*

1. apex predator

*A predator at the top of the food chain that has no natural predators.*

1. overfishing

*Harvesting fish at a rate that exceeds their natural reproduction rate, causing population declines.*

1. cascading effects

*The indirect effects of a disturbance or change in one part of a system that ripple throughout the system.*

**Acknowledgement:** This resource was written by Gerd Banke, Nayland School and is part of [Kaitiakitanga o te moana – a context for learning](https://www.sciencelearn.org.nz/resources/3384-kaitiakitanga-o-te-moana-a-context-for-learning).