

Wetlands Food Web

Teacher Notes

Secondary (7-10)

ACTIVITY DESCRIPTION

The Wetlands Food Web activity engages students in the complexities of a wetlands food web. Students will develop an understanding of the feeding interactions between communities of organisms and an appreciation for the delicate balance that exists within this environment. Students will explore the potential negative effects of human activities on the food web and suggest possible strategies to avoid or manage the impacts.

INSTRUCTIONS

It is recommended that students undertake the activity in groups of 3 or 4.

1. Students develop a wetlands food web showing the feeding relationships between plants and animals

Provide each group with a copy of the wetlands food web elements (plants and animals) and ask them to draw arrows between elements that eat or are eaten by another element e.g. students draw an arrow between the heron and the frog with the arrow head pointing to the heron (arrow head direction shows the flow of energy from one species to another).

Ask students to assign each element to a level in the trophic pyramid: primary producer, primary consumer, secondary consumer, tertiary consumer or decomposer and discuss their role in the food web.

2. Students identify key elements in the food web, identify human impacts and strategies to mitigate them.

Ask students to:

1. List all of the elements of the food web that rely on:
 - a) Water boatman
 - b) Algae
2. Identify three human activities that would negatively impact the wetlands food web
3. Mosquito fish are an introduced species that has found its way into many of our waterways in Australia. Research the possible impacts of mosquito fish on the wetlands food web
4. Devise a strategy to reduce the negative impacts of mosquito fish in Australian wetlands

SUGGESTIONS FOR ASSESSMENT

Formative

1. Completion of the food web and identification of the role of each plant and animal
2. Identification of potential negative human impacts on the wetlands
3. The development of the environment management strategy

BACKGROUND NOTES

According to [Parks Victoria](#), there are over 17,000 wetlands larger than 1ha in Victoria. These waters can be permanent or ephemeral, such as intermittently flooded wetlands and red gum floodplains.

Wetlands support natural processes that purify water and cycle nutrients, as well as providing important habitat for a variety of animals. Some species such as fish and frogs require water throughout their life cycle, some may use aquatic areas for a specific stage of their life cycle (e.g. birds and amphibians), while others may require aquatic environments for resources such as food or as a corridor for movement. The right conditions can result in large breeding colonies and a thriving, diverse ecosystem.

In an ecosystem, plants (primary producer) capture the sun's energy and use it to convert inorganic compounds into energy-rich organic compounds through the process of photosynthesis. There are many types of animals that will eat the products of the photosynthesis process (primary consumer), e.g. Swamp hen. When animals eat these plant products, food energy and organic compounds are transferred from the plants to the animals. These animals are in turn eaten by other animals (secondary consumer), again transferring energy and organic compounds from one animal to another. Eventually all things die and are broken down and used as food or nutrition by bacteria and fungi (decomposers). These simpler nutrients are returned to the soil and can be used again by the plants. The energy transformation chain starts all over again.

Many human activities can negatively impact wetlands: changes to water flow, pollution, changes to habitat and introduced species.

A small introduced fish that is having a big impact on wetlands in Australia is the Mosquito Fish (*Gambusia sp.*). Deliberately released into Australia to control mosquitoes, Mosquito Fish are now widespread throughout much of mainland Australia and northern Tasmania. Mosquito Fish are mainly carnivorous, feeding on a range of small freshwater invertebrates, windblown terrestrial insects, and the eggs, larvae and juveniles of native fishes and frogs. Mosquito Fish have been implicated in the decline of at least 9 fish species and more than 10 frog species in Australia. They compete with native fishes for habitat and food, and are very aggressive towards other species. (See <http://fishesofaustralia.net.au/home/species/3636#summary> for more information about mosquito fish).

ACCESS THIS ACTIVITY

Visit the **Sustainability Hub** to download the activity -

<https://sustainability.ceres.org.au/education-resources/curriculum-activities/>

Curriculum and RSS Links

KEY CONCEPTS

Biodiversity, Food Webs, Ecosystems, Food Chain, Human Impact on Ecosystems

KEY LEARNING INTENTIONS

1. Students will be able to describe the feeding interactions and relationships between organisms within a food web from a wetlands environment
2. Students will be able to identify human-induced environmental changes and the challenges they pose for sustainability in a wetlands environment

VICTORIAN CURRICULUM

Science

7 - 8 Interactions between organisms can be described in terms of food chains and food webs and can be affected by human activity (VCSSU093)	9 - 10 Ecosystems consist of communities of interdependent organisms and abiotic components of the environment; matter and energy flow through these systems (VCSSU121)
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Geography

7 - 8 Human causes of landscape degradation, the effects on landscape quality and the implications for places (VCGGK119)	9 - 10 Human alteration of biomes to produce food, industrial materials and fibres, and the environmental effects of these alterations (VCGGK136)	9 - 10 Environmental, economic and technological factors that influence environmental change and human responses to its management (VCGGK145)
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SUGGESTED RESOURCESMART SCHOOLS MODULE LINKS



Undertaking the activity as described above links to the ResourceSmart Biodiversity Module - actions B1.1, B1.3, C1.4, B1.1, B1.2, B1.3, and B1.4

Below is a list of extension activities that link to additional actions of the Biodiversity module:

1. Extend the activity to include the following categories and classifications (*ResourceSmart Schools Biodiversity Module - action B1.1*)
 - Students categorise each element of the food web according to whether they are producers or consumers
 - Students categorise each element of the food web according to whether they are plants, reptiles, amphibians, insects, birds or fish
 - Students categorise the elements of the food web according to whether they live on land or in the water
2. Write a story about the activity and include it in your school newsletter or on the school website. Provide tips on how to promote and protect biodiversity in your community (*ResourceSmart Schools Biodiversity Module - actions C1.1, C1.3, C3.5*)
3. Conduct a field trip to a local wetland environment or CERES Environment Park (*ResourceSmart Schools Biodiversity Module - actions B1.1, B1.3, A1.1, C3.3*)

Make observations and record:

- the species and organisms that are present
- the relationships between the different elements of the wetlands ecosystem
- the negative impacts that are occurring as a result of human activities

Propose strategies and/or develop a project for the management of these negative impacts.

4. Conduct a Biodiversity Audit of the school grounds, using CERES or Cool Australia audit. Identify ways the school can improve its biodiversity (*ResourceSmart Schools Biodiversity Module - actions A1.1, A2.1*)

Speak to your CERES ResourceSmart Schools Facilitator about further links to the Biodiversity Module.