

### Classroom Activity - Create a food web and integrated diagram (Grade 1 – 6)

**Overview:** Within any ecosystem there is an intricate web of relationships between living things. Saltmarshes and neighbouring tidal flats occur at the interface between marine and terrestrial environments, so are complex systems. They are also extreme environments, where plants and animals take on adaptations to survive. Drawing food webs requires some thought on an animal's diet, and the many levels of a food chain. This activity is most effective after students have had some introduction to saltmarsh and tidal flat species and processes (see other Derwent Estuary Program (DEP) designed classroom activities). Activity guidelines are provided for different age groups to guide students through the creation of their own food web.

This activity will help students understand:

- how energy passes through an ecosystem,
- the feeding relationships between organisms, called the food web,
- how individual animals and plants rely on each other, and
- how the disappearance of one part of the food web can affect and upset the balance of an entire ecosystem.

**Task:** An overview of the major species in saltmarsh and tidal flats within the Derwent Estuary can be found on the DEP website, or in the 'What Species Is That?' DEP Classroom Activity. Ask the students to draw their own food web on an A3 piece of paper. They can turn what they have learned about saltmarsh and tidal flats into drawings focusing on the inter-relationships between different animals and different plant types. A food web can be drawn for any habitat, where plants or microscopic algae (producers) turn sunlight and nutrients into edible material for plant eating animals (first order consumer or herbivore), who are themselves predated (eaten) by other consumers. A food web is just a simplified diagram of numerous hand drawn animals and plants with arrows added to show the predator – prey linkages, or 'who eats who'. Ask students to arrange their drawings of animals and plants evenly across an A3 page, filling it entirely with different species.

Higher age groups can draw more complex food webs.

#### **Grades 1 - 2**

At its simplest level, draw five or six different plants and animals. Next, draw arrows on the page from one to the other to show who eats who, thereby representing the linkages between them.

#### **Grades 3 – 4**

Ask the students to think about the various factors that impact/damage saltmarsh from natural processes to human-based impacts. What happens to the rest of the food web if key plants or animals disappear.

*Will it collapse? Or can other animals/plants take their place?*

Different types of impact could include damage or loss of habitat (e.g. removal of saltmarsh vegetation), or direct exploitation (e.g. fishing flathead or flounder).

**Grades 5 – 6**

Ask the students to think about the layout of the environment before they construct their food web, by drawing land and water on either side of the page and the gradient of other habitats and vegetation in between. Apply some fore thought, then draw each animal and plant in their correct habitat (aquatic, intertidal, terrestrial). Perhaps also show the underlying ecological and physical processes of these habitats with bold arrows (e.g., 1. Seepage of detritus from saltmarsh plants to tidal flat to feed microscopic algae in mud, 2. Deposition of sediment and organic material from ocean onto tidal flat and saltmarsh at high tide, 3. Filtration of runoff water from land to ocean by saltmarsh). When the students have finished drawing their food web ask the class:

*What would happen if there was too much fishing by local fishermen?*

*What would happen to the fish?*

*What would be the flow on effects to their prey and their competitors in the tidal flat habitat, and more broadly in the whole estuary?*