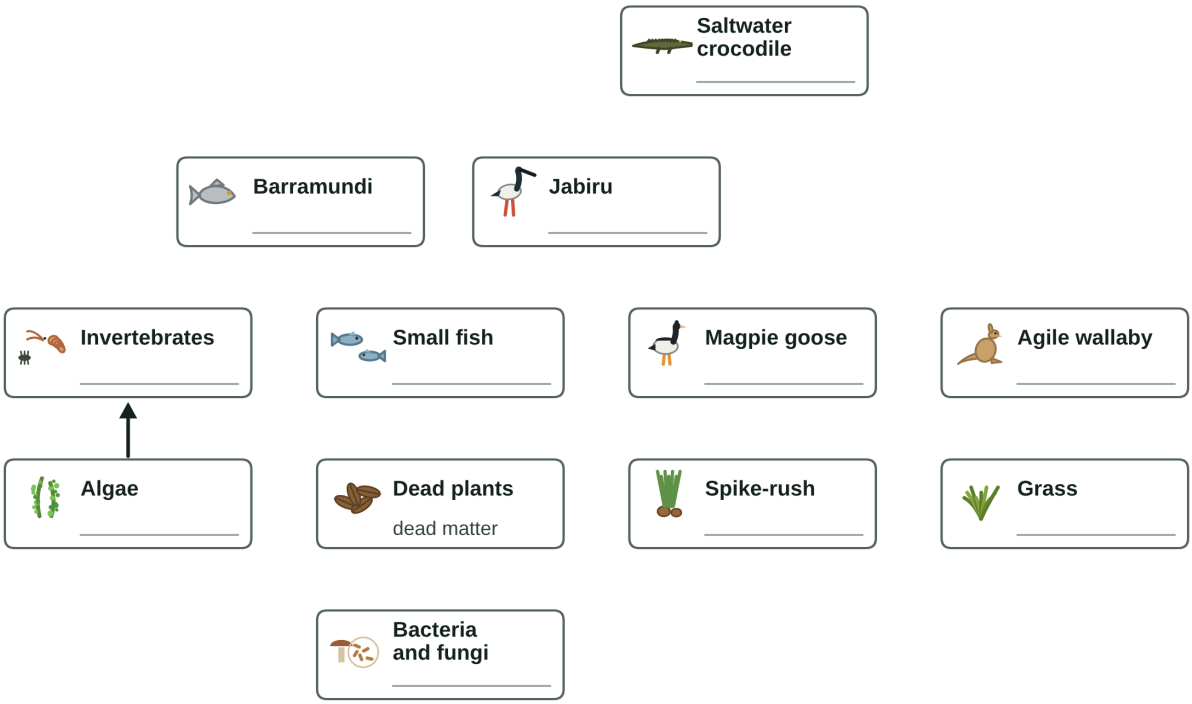
Explain a change in a food web

Names: Class: Date:

Work with a partner. In Part 1 you finish a food web for a Top End floodplain billabong. In Part 2 you explain three changes in Top End ecosystems by what happened, which parts were involved and how it happened.

PART 1 Finish the billabong food web

1. Read what each living thing eats, in the box under the food web.
2. Draw an arrow from each food to the living thing that eats it, so the arrow points the way the energy and matter move. The first arrow is drawn for you.
3. On the line in each box, write producer, consumer or decomposer.



What eats what

- Invertebrates and small fish feed on tiny algae that grow on water plants and in the water. They also feed on decaying plant matter.
- Bacteria and fungi break down dead plants.
- Barramundi eat prawns, insects and fish.
- The jabiru eats fish and small crustaceans, and prawns are crustaceans.
- Magpie geese eat the underground bulbs of spike-rush, grass seeds and the blades of grasses.
- Agile wallabies feed on grasses and other plants, mainly at night.
- Saltwater crocodiles eat barramundi and wallabies.

Invertebrates are animals without a backbone, such as prawns and insects.

From the Northern Australia Hub's Kakadu research, the NT Government, the Australian Museum, Frith and Davies (CSIRO), the Territory Wildlife Park, and OpenStax's Concepts of Biology and Biology 2e. The lesson notes list them in full.

1. Write a food chain from your food web with four living things in it.

2. Suppose all the barramundi were taken away. What would happen to the number of small fish? What might happen to the algae? Use your arrows to explain.

3. In the food chain algae → small fish → barramundi → saltwater crocodile, the algae store 10,000 units of energy. Suppose one tenth of the energy at each level passes to the next. How much reaches the crocodile, and what happens to the rest?

PART 2 Explain three changes

Explaining a change in three parts

- **What happened:** the change you can see (the phenomenon).
- **The parts involved:** the living and non-living things that play a part (the components).
- **How it happened:** how the parts act on each other, step by step, to cause the change (the mechanism).

Read the facts about each change, then use them to fill in its table.

1. Dead fish in a billabong

- Fish kills happen most often early in the wet season, often after the first big storms.
- Early wet season storms can wash large amounts of organic matter, such as dead plant material, and soil into billabongs.
- Bacteria use oxygen as they break down organic matter.
- During the day, water plants and algae make oxygen. At night every living thing in the water uses oxygen, so the oxygen is lowest at dawn.
- Fish die when they can't move away from water with too little oxygen.
- At the end of the dry season the water is warm, and warm water can hold less dissolved oxygen than cool water.

What happened	
The parts involved	
How it happened	

2. Dying cypress pine groves

- The northern cypress pine is a fire-sensitive tree. It grows in small, dense groves in a savanna where most trees are eucalypts.
- A closed grove has less fine fuel than the savanna around it, and low-intensity fires usually don't burn in.
- Fires late in the dry season are much more intense than early dry season fires, because there is more leaf litter, drier fuel and more extreme fire weather.
- Fires are more severe the longer it has been since the last fire.
- Adult cypress pines survive frequent fires, but moderate-intensity fires kill them easily.
- In parts of the Northern Territory, most of the cypress pines in some stands are dead and no young trees are growing.

What happened	
The parts involved	
How it happened	

3. Para grass on the floodplains

- Para grass probably comes from floodplains in Africa. It was brought to Australia to grow as pasture for farm animals.
- It has spread across Top End floodplains. It can replace the mix of grasses, sedges and shrubs that native animals need with large areas of para grass alone.
- Para grass supports very little algae.
- Small fish and invertebrates depend on algae, and barramundi eat small fish and invertebrates.
- Para grass seeds have very little nutrition for seed-eating animals compared with native wild rice.
- Where para grass spreads, magpie geese lose habitat.

What happened	
The parts involved	
How it happened	

Answers (turn the page round). Food web: arrows from algae to invertebrates and small fish; from dead plants to invertebrates, small fish, and bacteria and fungi; from invertebrates and from small fish to barramundi and jabiru; from barramundi and from the wallaby to the crocodile; from spike-rush and grass to the magpie goose; and from grass to the wallaby. Algae, spike-rush and grass are producers, bacteria and fungi are decomposers, and the animals are consumers. **1:** for example, algae → small fish → barramundi → saltwater crocodile. **2:** the small fish would increase, because only the jabiru would be left to eat them. More small fish and invertebrates would eat more algae, so the algae would probably decrease. **3:** 10 units (10,000, then 1,000, then 100, then 10). At each level the rest is used for living and lost as heat, or goes to decomposers. **Dead fish:** fish died after the first big storm of the wet season. The parts are the organic matter, bacteria, oxygen in the water, algae and water plants, the fish and the water temperature. Bacteria used oxygen breaking down the organic matter the storm washed in. At night no oxygen was made and every living thing kept using it, so by dawn there was too little for the fish. Warm water held less oxygen to begin with. **Cypress pine:** the groves are dying. The parts are the cypress pines, fire, the fuel and the season and weather. Early, frequent fires are low-intensity and stop at the edge of a closed grove. Late dry season fires, and fires after fuel has built up for years, are intense enough to burn in and kill the adult trees. Young trees grow thickly where fire is kept out (Bowman and Panton). **Para grass:** there is less algae, less food for floodplain animals and less habitat for magpie geese. The parts are para grass, native plants, algae, small fish and invertebrates, barramundi and magpie geese. Para grass replaces the native plants and supports very little algae, so small fish and invertebrates have less food, and so do the barramundi that eat them. Magpie geese lose the plants that give them habitat and food.