KESAB Patawalonga and Torrens Waterwatch

Food webs – Work sheet (Middle years)

Read through the text, design a food web and answer some questions from the following information:

The Torrens River starts in the Adelaide hills as several small creeks which join to form one larger creek. As it winds its way down the hills to the city, more and more water is added. It generally only flows in winter when the rainfall is sufficient, and dries up into small waterholes during the summer. A weir is used to hold water permanently in the city. It is surprising how many organisms rely on the river for their existence.

Algae can be observed growing in the water, as well as water ribbons *(Triglochin procerum)*. On the water edge, fluffy topped reeds such as the common reed *(Phragmites australis)* and the bulrush *(Typhus sp)* grow. Water boatman are observed swimming in the water. They are eating the algae and reeds. Mosquito larvae also eat the algae while the fresh water snail eats both the algae and water ribbons. A long necked tortoise pokes its nostrils above the water. The tortoise eats the algae too, as well as feeding on snails, boatman and yabbies. The water boatman provides food for many species including fish, frogs, diving beetles and dragonfly larvae. The yabbies are scavengers, feeding on rotting plant and animal matter, while bacteria also help break down this dead material by digesting it and recycling nutrients in the food web. The mosquito larvae are considered a delicacy for frogs (such as the common froglet) and several varieties of fish (such as the big-headed gudgeon or the congolli).

Birds are in abundance along the waterway. Pacific black ducks are feeding on fish, dragonfly larvae and diving beetles, while the occasional visiting pelican feeds on fish, frogs and dragonfly larvae. Black swans make a beautiful sight, bending their elegant necks to forage under the water grazing on the water ribbons, snails and an occasional fish. The white-faced heron makes a meal of the fish and frogs. The purple swamp hen runs quickly from the bulrushes where it feeds on the tender growth of the bulrushes and also makes its nest. On the bank a blue-tongue lizard is sunning itself in a warm rock. It snaps at the dragonflies and diving beetle and beware the unwary frog, the lizard will sometimes eat them too.

1. Now complete your food web

It is best to start with the producers and build up. When you are happy with your placement, glue/write the animals in place and complete the arrows to show the flow of energy. You may need to read through parts of the text again.

(Note: Teachers: you may wish to photocopy the animal sheet for students to cut out and place on an A4 sheet. This will enable them to shift animals and plants around to best fit the intricate food web.)

2. Divide the organisms into the following categories:

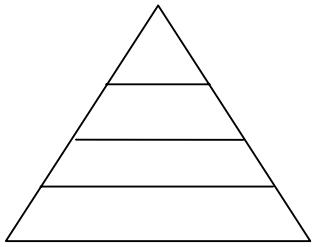
Producers	Ist Order Consumer	2nd Order Consumer (and higher)

3. Which of the organisms contain chlorophyll? Are they producers or consumers? How do youknow?_____
   _____

4. Which organisms feed on algae?_____

5. Which organisms feed on fish?_____

6. Find a food chain from your web with at least 4 organisms. Place them in the pyramid with the producer at the bottom and the highest order consumer at the peak. Estimate numbers of organisms for each level (their population) in that habitat. It should decrease as it goes higher. Infer or explain why this happens.



7. The decomposers. What organisms are decomposers? Where do they live? What do they do? Indicate where they fit in your food web.

_____
_____
_____
_____

8. Predict what would happen to the organisms if:
   a) an oil spill occurred nearby
   b) all the fish were killed
   c) several house owners nearby fertilised their lawns followed by a big rain.
   d) the weather is warmer than usual and less rain falls

_____
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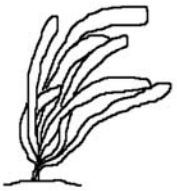
Wetland
Food Web Images

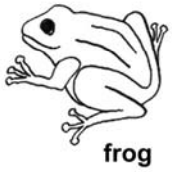

water ribbons


algae


mosquito larvae


mosquito


bulrushes

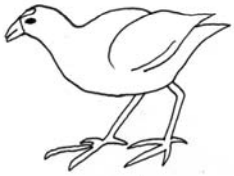

frog


heron


reeds


dragonfly


fish


swamp hen

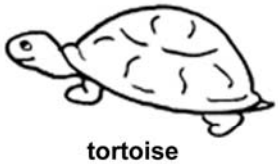

freshwater snail


lizard

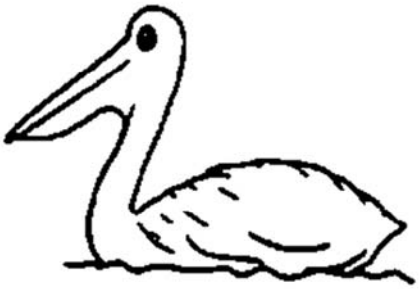

water boatman

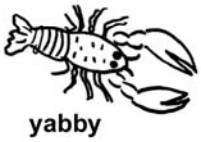

diving beetle

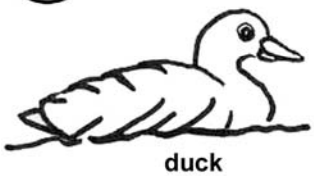

dragonfly larvae


tortoise


black swan


pelican


yabby


duck

Food webs – Work sheet (Middle years) **Teacher notes**

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Birds are in abundance along the waterway. Pacific black ducks are feeding on fish, dragonfly larvae and diving beetles, while the occasional visiting pelican feeds on fish, frogs and dragonfly larvae. Black swans make a beautiful sight, bending their elegant necks to forage under the water grazing on the water ribbons, snails and an occasional fish. The white-faced heron makes a meal of the fish and frogs. The purple swamp hen runs quickly from the bulrushes where it feeds on the tender growth of the bulrushes and also makes its nest. On the bank a blue-tongue lizard is sunning itself in a warm rock. It snaps at the dragonflies and diving beetle and beware the unwary frog, the lizard will sometimes eat them too.

9. Now complete your food web
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(Note: Teachers: you may wish to photocopy the animal sheet for students to cut out and place on an A4 sheet. This will enable them to shift animals and plants around to best fit the intricate food web.)

10. Divide the organisms into the following categories:

Producers	Ist Order Consumer	2nd Order Consumer (and higher)
Reeds *Bulrushes* *Algae* *Water ribbons*	*Water boatman* *Long necked Tortoise* *Mosquito larvae* *Yabbie* *Fresh water snail* *Swan* *Swamp hen* *Diving beetle*	*Blue tongue Lizard* *Fish-Congolli and big headed Gudgeon* *Common Froglet* *Dragonfly larvae* *Pacific Black Duck* *White faced Heron* *Pelican*

11. Which of the organisms contain chlorophyll? Are they producers or consumers? How do you know? *Algae, reeds and water ribbons. They are all producers, and use the chlorophyll for photosynthesis. They are able to convert sunlight into energy, thus producing their own food.*

12. Which organisms feed on algae? *Tortoise, water boatman, mosquito larvae, snail*

13. Which organisms feed on fish? *Ducks, heron, pelican*

14. Find a food chain from your web with at least 4 organisms. Place them in the pyramid with the producer at the bottom and the highest order consumer at the peak. Estimate numbers of organisms for each level (their population) in that habitat. It should decrease as it goes higher. Infer or explain why this happens.
    The energy from the sun is trapped by the producers and then is passed on up the food chain. Not all the energy is passed on as each organism uses some of the energy for growth and movement. As you go higher, there is less and less energy available so there are fewer organisms at each level.

E.g.

Pelican	(2 birds)
↑	
Frog	(35 frogs)
↑	
Mosquito larvae	(100,000 larvae)
↑	
Algae	(3 million algae)

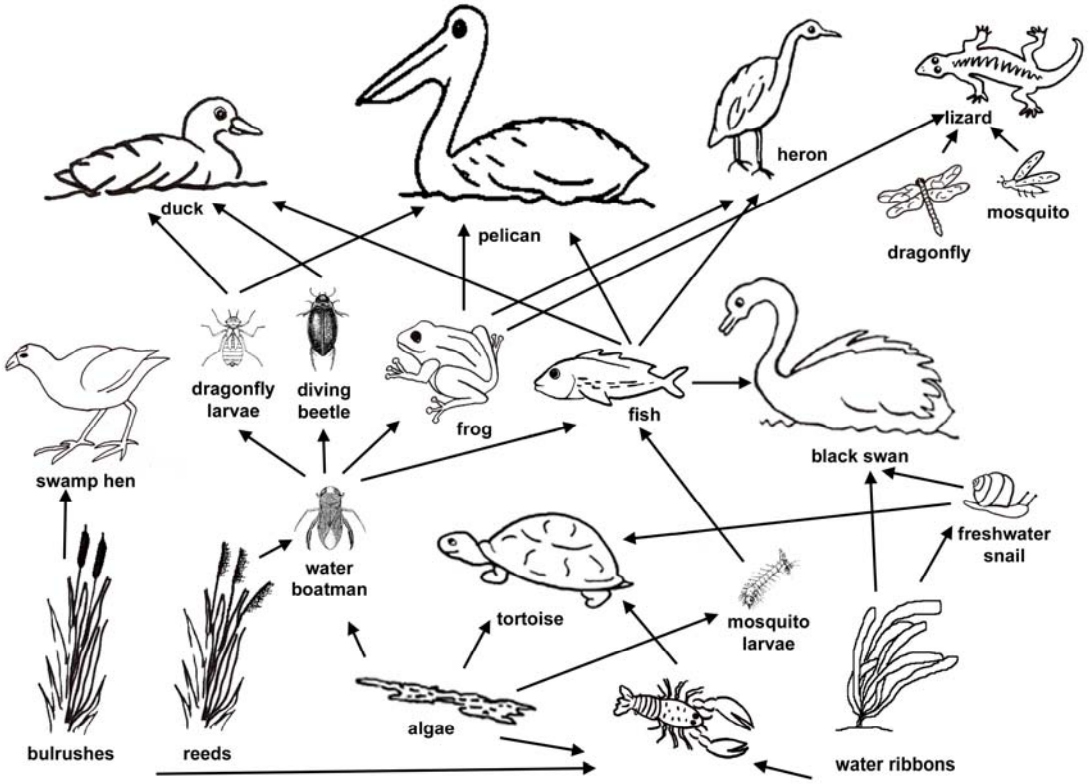
15. The decomposers. What organisms are decomposers? Where do they live? What do they do? Indicate where they fit in your food web.
    The decomposers are the bacteria and fungi. They live in the soil and in decaying plant and animal matter on the creek or river-bed, They are able to process the larger organism, breaking them down into simple components which they use as food. The simpler components are expelled as waste products and are returned to the food chain.
16. Predict what would happen to the organisms if:
    e) an oil spill occurred nearby
    f) all the fish were killed
    g) several house owners nearby fertilised their lawns followed by a big rain.
    h) the weather is warmer than usual and less rain falls

    a) Oil forms a layer on the top of water, which is impervious to oxygen and or gas transfer. Macro invertebrates would be unable to obtain oxygen, and if they enter the oil layer, the oil covers their gills/breathing apparatus preventing them from functioning. Many animals and plants in the river would die or suffer long term effects.

    b) The water birds which rely on fish as a food source would move to another area to find food (increasing competition) or face starvation

    c) Lawn fertiliser usually contains, large amounts of nitrogen and phosphorus (as well as smaller amounts of potassium and sulfur and other minor elements. Nitrogen and phosphorus will cause a dramatic growth of the algae in the river, possible causing an "algal bloom". These blooms can occur naturally, but more often when increased nutrient flow into a river, the algae can reduce the oxygen significantly in the water (killing/stressing fish and other organisms) and can produce toxic by products making water unsuitable for drinking and use.

    d) Less water will mean higher concentrations of salts and other nutrients in the water. Higher temperatures may be more suitable for breeding and cause a rapid increase in number of organisms such as algae and macro invertebrates, while warmer water will affect the amount of dissolved oxygen in the water.


duck
pelican
heron
lizard
dragonfly
mosquito
dragonfly larvae
diving beetle
frog
fish
black swan
swamp hen
water boatman
freshwater snail
tortoise
mosquito larvae
bulrushes
reeds
algae
water ribbons