

Rutland Water Food Web

Do you know your feeding relationship words?

Producers

1. What is meant by the word producer? *An organism which can synthesise large molecules from simpler molecules using energy from the sun (photosynthesis)*
2. Name 3 producers shown in the Rutland Water food web. *Pondweed Reeds Algae*

Herbivores

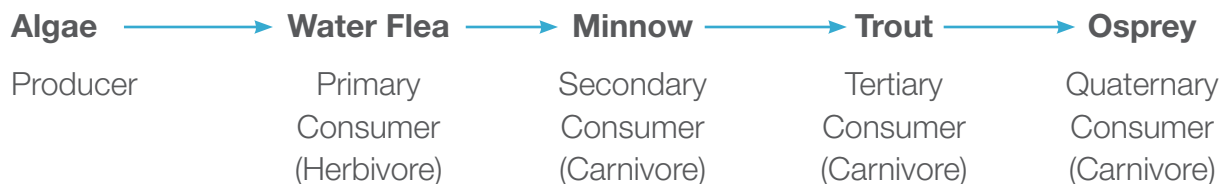
3. What is a meant by the word herbivore? *An animal which feeds on plants.*
4. Name 3 herbivores shown in the Rutland Water food web. *Water flea, Mallard, Pond snail*

Carnivore

5. What is meant by the word a carnivore? *An animal which feeds on other animals*
6. Name 3 carnivores in the Rutland Water food web. *Minnow, Mallard, Water Insect larvae, Trout.*

Making a food chain?

A food chain shows is the order of organism through which food energy passes . Food chains always begin with a producer. Arrows show the direction of the energy flow from the producer to other organisms in turn.

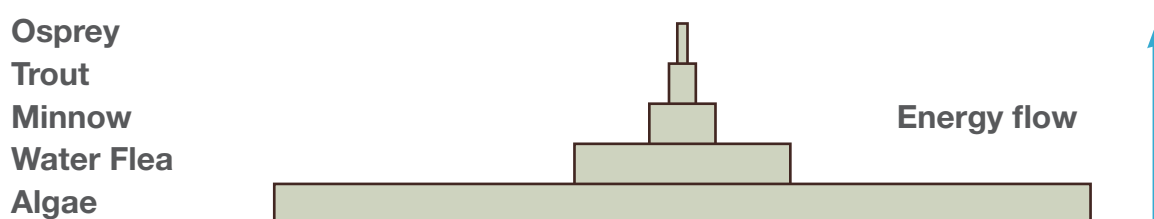


The “feeding level” is shown under the food chain. This is known as a trophic level.

7. Draw 3 more food chains you can find in the Rutland Water food web.
For each food chain label the “trophic levels” underneath. *Any three food chains as shown above. The Producer should be on the left and the energy flow towards the right. Check labelling of Consumers and feeding relationship (in brackets)*

Pyramids of number

This is a more useful way of showing the energy flow through a food chain. Each block represents the number of organisms in each trophic level in a food chain.



Rutland Water Food Web - cont.

8. Draw and label a food pyramid for each of your food chains in Q7.

Food pyramid should look like the one above with block representing the relative numbers of each feeding level. Energy flow should be upwards with the feeding level (called trophic level) on the left

Pyramids of biomass

Pyramids of number have a problem. The size of the plants and animals vary.

One way around this is to work out the total weight of the organisms in each trophic level. To do this scientists take samples from the habitat and measure the weight of the species. They use this to work out the total mass of each of the species of organisms in the whole habitat. This weight of living organisms is known as **biomass**.

This weight of each level known as “**biomass**”

9. Can you suggest why it is difficult to find the biomass of organisms in a habitat **accurately**?
Distribution or organisms varies. Seasonal variation, and daily variation too. Sampling(catching) may be difficult. The size of the organism and sampling method may cause inaccuracies. It is difficult to measure plants which are rooted in the ground or pond bed!
10. How could you ensure your samples of organisms for the biomass was **reliable**?
Take several samples (ie many repeat readings) and do this at different times of day or through the season. This will “even-out” variation in the samples.

The problem of Water

The amount of water in living organisms varies. To be even more useful the biomass figures should not include water. This weight is called **Dry Mass**.

11. If you had a sample of water plants, explain how you could find its **dry mass**.
Put the sample of plants in an oven at 100C to dry them. Repeat weighings until mass is constant ie fully dry.
12. Can you suggest why it is not ethical to sample a whole ecosystem and find the dry mass of the plants and animals.
Environmental disturbance is caused by sampling. The organisms will have to be dried so they will be killed - this is not ethical.