

The Living World: A Freshwater Pond Ecosystem

What is A Freshwater Pond Ecosystem?

Ponds are **freshwater ecosystems** found throughout the UK that host a variety of **freshwater species**.

Freshwater ponds are interesting ecosystems as they are under influence from a variety of different **abiotic** (non-living) **components**. Factors such as **light, water and oxygen availability** change in a relatively small area, like from the **edge** of the pond to the **bottom**.

This creates a **diverse ecosystem** with different **biotic** (living) **components** adapted to varying environmental conditions.



(Source: [The Wildlife Trusts](#))

Freshwater pond ecosystems consist of different **organisms** that produce and transfer **energy** through the system.

Producers



Producers are organisms that **convert energy** from the **environment** (mainly sunlight) **into sugars** (glucose).

Algae and microscopic plants are examples of producers in the freshwater pond ecosystem. They **convert energy from the sun into glucose** via **photosynthesis**.

Consumers



Consumers are organisms that receive energy from **consuming** (i.e. eating) **living organisms**.



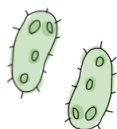
Consumers may **eat producers**, and receive energy from the **sugars** made by producers (e.g. midge larvae eat algae).

However, some consumers receive energy by eating **other consumers** (e.g. a fish may eat midge larvae - another consumer).



Primary consumers are organisms that eat **producers**. **Secondary consumers** are organisms that eat **primary consumers**.

Decomposers



Decomposers **break down organic material** (e.g. dead plants and animals or faeces) and release the **nutrients** from this organic material into the **soil**. These nutrients are **absorbed by plants** when they grow.

Bacteria, worms and maggots are examples of decomposers in a freshwater pond.

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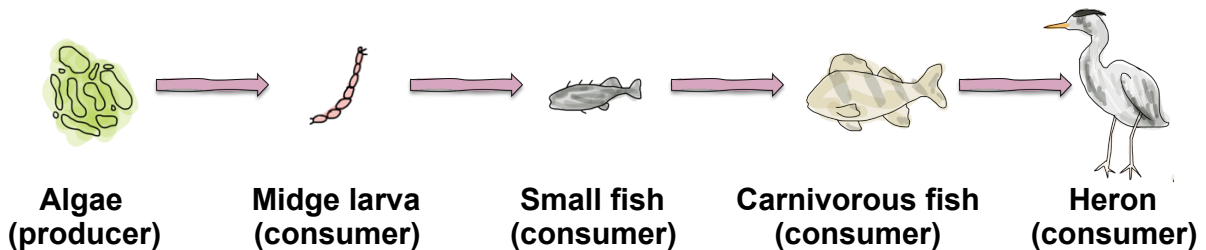


Interactions within Freshwater Pond Ecosystems

Within a freshwater pond ecosystem, producers, consumers and decomposers interact with each other. These interactions can be demonstrated with **food chains** or **food webs**.

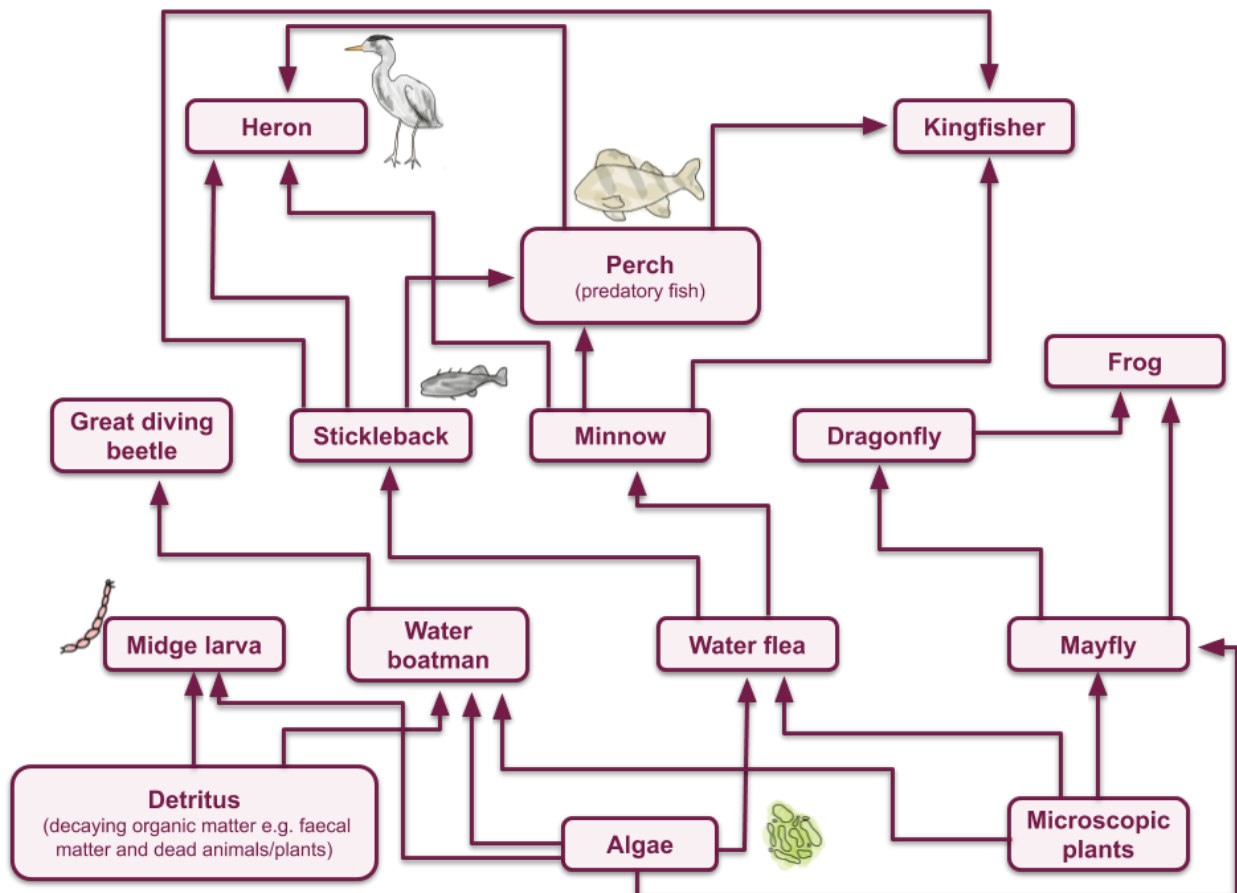
Food Chains

A food chain shows how **producers and consumers** interact within the ecosystem. Food chains are usually depicted in a **straight line**, starting with the producer and ending with the last consumer in the chain. Below is an example of a food chain in a typical UK freshwater pond:



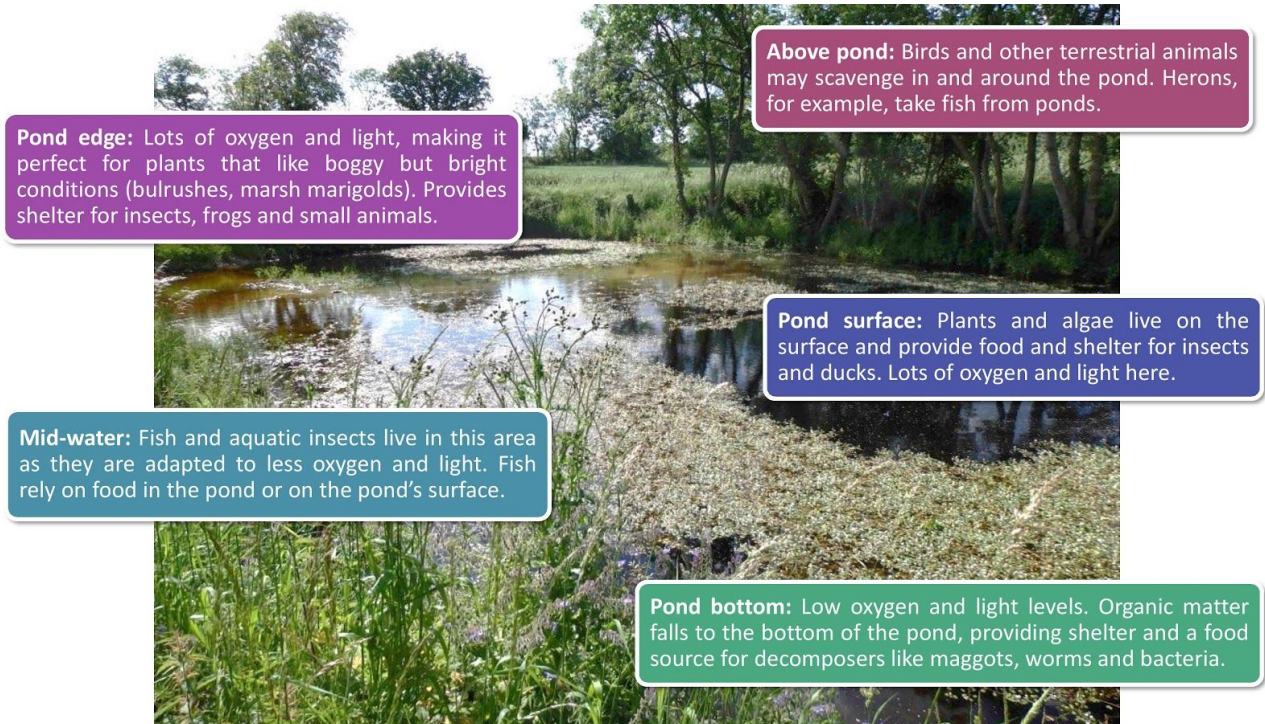
Food Webs

The complex relationships between producers and consumers in a freshwater pond can be demonstrated by **food webs** like the one below.



Interrelations within Freshwater Ponds

The freshwater pond ecosystem is **delicately balanced**. The **biotic and abiotic** components of the ecosystem are **interrelated**, meaning they influence and are connected to each other. In the diagram below, notice how different components in the freshwater pond ecosystem are related.



Nutrient Cycling

Nutrients are substances that fuel **plant and animal growth**, such as **nitrates** and **phosphates**. In a freshwater pond ecosystem, nutrients come from different sources:

- Rocks and minerals (e.g. phosphorus containing rocks) **break down** by **weathering**, which releases nutrients into the **soils**.
- Chemicals in the **atmosphere** can be **washed out** within **precipitation**.
- Special bacteria can **absorb chemicals from the air** and store them in soil.

Nutrients are **transferred throughout the ecosystem** in different ways. Animals and plants die, and decomposers **break up their organic matter** into nutrients, which are put **back into the soil**.

