

This **Ecosystem** diagram shows how everything living on the Down lives off everything else. Note that without the sun's light and heat nothing could live! Note as well that even dead matter provides the building blocks for new life.



Sunlight provides the energy needed for photosynthesis in green plants.



Brading Down

Carnivores: Predators such as weasels, stoats and owls eat herbivores; but insectivorous birds are also acting as carnivores when they devour caterpillars and plant-feeding insects.



Removal of sheep to market represents a loss to the grassland ecosystem.

Herbivores: Plant material is eaten by mammals such as voles, rabbits and sheep. There is also major consumption by insects and molluscs. Birds eat little foliage but may consume large amounts of energy stored in plants through eating the seeds and berries of shrubs and flowers.



Some plant production is removed from the ecosystem in the form of hay crop, but is not an important loss to many calcareous grasslands because they are better used by farmers for grazing.

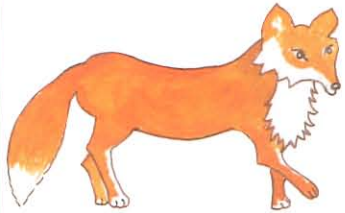


Primary producers: These are mainly grasses, but also small herbs and a few large shrubs. Photosynthesis combines water and nutrients from soil with carbon dioxide from the air to form plant tissues, proteins and carbohydrate food stores, for example in seeds and nectar.

Litter, dead plants: Little of the primary productivity goes this way because most is eaten by herbivores.



Many carnivores in grassland prey on decomposers which live in the soil: skylarks eat insects living among grass roots and badgers take large numbers of earthworms.

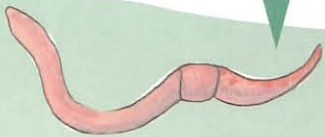


Carnivore carcasses and faeces return materials to the soil decomposers.

About half the food eaten by herbivores is returned to the soil as faeces, along with the animal's body after death. In grassland, the return of faeces to the soil is very important.



Decomposers in grassland: These consist of earthworms, dung beetles and hosts of tiny arthropods, fungi and bacteria which play a vital role in breaking down plant and animal debris; without this action, dead material would accumulate. Decomposers not only physically reduce matter to tiny particles, but also dismantle the molecules of which they are made. Carbon dioxide, is therefore, returned to the air and inorganic nutrients are released in a form in which they too can be reabsorbed by living plants.



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Isle of Wight
area of outstanding natural beauty

Ecosystem

What is an Ecosystem?

Wherever there is a bare patch of earth which is hospitable to life, it becomes colonised by plants. Animals then move in and a community of plants and animals is established.

The place where plants and animals live is called a habitat. Brading Down could be called a downland habitat. Others might be a wood or a pond or so on. The whole interlinked complex of plants, animals, and physical features (soil, water, air) is called an ecosystem. The diagram overleaf illustrates this.

Downland is an unstable habitat because it becomes overgrown by scrub unless grazing animals keep the woody plants from getting established. Grasses are able to put up with a lot of grazing, so the Down shows links between the grasses and grazers (for example, sheep and rabbits). The grass provides food and the sheep and rabbits keep other more woody plants at bay – so the grasses stay as the most important plants.

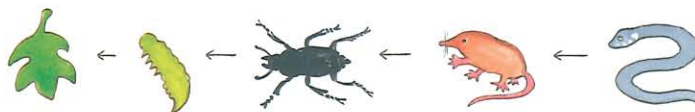
As the grasses are kept short by grazing, so many sun-loving plants can grow and flourish. This means lots of different types of plants (or species) can grow. In turn, lots of different insects can live, which then provide food for higher animals like weasels and owls.

If grazing is reduced (no sheep), then taller woody plants can grow and the smaller but more varied plants die out because the ground is shaded. This process is called 'succession'.

What is 'Succession'?

Unless there are farmers preventing change (for example, by chemical spraying), then plant and animal communities do not remain the same for long. In the natural world, a process called 'succession' occurs. One type of vegetation becomes dominant for a while, but then creates conditions which enable other plants to grow. They take over: the process continues until no further change is possible. This is called 'climax vegetation' and is usually woodland. Simply expressed, the process moves from bare soil to grasses to bushes (scrub) to woodland – so it is important that grass is kept short by grazing.

Sheep farming is less popular with farmers nowadays, and many rabbits have been killed off by a disease called myxomatosis which first appeared in Britain in 1954. Can you think of any other ways scrub could be removed? You may have noticed areas where another method has been used.



Food Chains and Food Webs

Let's start with a grass snake. What might it feed on? A shrew is likely – which, in turn, might eat the beetle which feeds on the caterpillar. Look at the picture below left. What does the caterpillar feed on? This is the food chain.

Now let's look at a hedgehog. With a hedgehog, we might work back in the same way to a spider ... which might feed on a woodlouse ... which, in turn, feeds on tree bark. This is another example of a food chain. Food chains are linked together to form food webs.

All living things, including human beings, are linked together to form webs. As you can see from the picture of the food web below, the situation can become very complicated! If grass were to disappear, a lot of living things would be affected too. Which creature is at the top of this food web? You will notice that everything in this diagram depends on green plants – these are nature's food factories. Green plants make their own food from the sun's energy. They can then produce oxygen for humans, and all animals, to breathe.

