

Vegetation Zones

The mountain beech forest community is the main type of ecosystem you will meet at Arthur's Pass. There are several other plant and animal communities to be discovered.

The general **climate** determines which plants, insects and birds will flourish in different places. If you look at the rainfall graphs in the weather section you will see that Otira, Arthur's Pass, and Bealey all have quite different rainfalls which affects the vegetation as you go from east to west. The type of vegetation, and hence the animals associated with it, is also affected by the **altitude**. When you go higher up the mountains you will notice the vegetation changes quite dramatically. The mountain area from the riverbed to the mountain top can be separated into **vegetation zones**. Each zone has different types of plants which are dependent on local climatic factors and other factors such as soil fertility which vary with altitude.

The **Bealey riverbed** is one such vegetation zone that you will be introduced to at Arthur's Pass. In this ecosystem it is very dry and stony, so the plants that we find are **mat plants, cushion plants** and **small herbs** and **grasses** that like this well drained habitat where they are exposed to full sunlight.

The **mountain beech forest ecosystem** that you will walk through on the Bridal Veil Walk is the main plant community near the Village.

On the walk up the upper Bealey Valley you will notice that the beech trees get smaller as you come into **alpine forest** and then **shrublands**.

If you go on up to Arthur's Pass itself you will be able to see several different zones of vegetation. The forest terminates abruptly just short of the summit of Arthur's Pass giving way to **tussock, scrub, alpine grasslands** and **boglands**.

Shrublands Zone

Above the bushline there are frequent snowfalls and more frosts, so the **shrubs** and **tall tussocks** growing here have adapted accordingly. Shrubs like the **grass tree** have adapted with shiny needle-like leaves that shed the snow easily. Have you met a **Spaniard** in the mountains? **Flax plants** have adapted with nectar-filled flower tubes to attract birds and insects.

The Alpine Ecosystem

As you go higher up the mountainside, the temperatures get colder, and the climate is more severe. Soils are less fertile because of the high rainfall which **leaches** the **nutrients**. Shelter is always scarcer above the tree line and plants are exposed to the full force of wind, rain and snow. The **subalpine** and **alpine** plant and animal communities must be very hardy and well adapted to survive in the severe conditions high up the mountainside. There are mostly small shrubs and alpine grasses in this ecosystem many of which, like the **giant buttercup**, have beautiful flowers in the summertime to attract moths and other insects to pollinate them. The flowers are often scented as the moths mostly fly at night. Many people visit Arthur's Pass just to see the alpine flowers. Alpine flowers like the giant buttercup are snow covered for most of the winter. They have adapted with large leaves that enable them to absorb sunlight for **photosynthesis** to manufacture a lot of food in the summertime. This food is stored in their underground cellars or root system. It can be used to sustain the plant in winter when the snow cover prevents it from seeing the sun.

Microclimates

As well as these broad vegetation zones, local differences in conditions can create **microclimates** which produce a change in vegetation. Near the Devils Punchbowl Waterfall there are only small battered shrubs growing. This is due to the excessive wetness and wind associated with the waterfall which has created a climate similar to that found higher up the mountains.

Plant Succession

The first stage in the process of **plant succession** can be seen in the Bealey riverbed. This is the process by which plants **colonize** a scree slope or shingle riverbed, and eventually, if undisturbed over many hundreds of years, forest is formed.

The forest has not always been at Arthur's Pass. After the glaciers had formed U-shaped valleys, these collapsed to form V-shaped valleys with bare scree, rock and shingle slides. After a time small plants and grasses found tiny pockets of sandy soil in which to grow. They are adapted to the dry, well drained sandy soil, and like the open sunny habitat. Such plants as **lichens, mat daisies, cushion plants, and willow herbs** are some of the first plants to colonize the bare rocky areas in the first stage **of plant succession**.

When these plants die they decay to enrich the soil for other plants. Grasses and small shrubs will establish themselves if conditions are right. Perhaps some birds will drop seeds. As plants die and decay, more soil rich in nutrients is formed. Bigger shrubs like the **hebe** will be able to grow. The shade created will encourage **ferns** and other shade dependent plants.

This process of plant succession continues until eventually native beech forest is established. This is not the end of the process, as the cycle of dying and birth continues to **regenerate** the forest.

We can see this process of plant succession in the Bealey riverbed on the edge of the forest, where the sequence **of mat plants** growing on the dry river bed, to **shrubs** and **grasses** on the forest edge, to **ferns** and **beech trees** in the forest, is clearly visible.