

Interdependencies

Within the mountain beech forest dwells a vast number of inhabitants which all have a part to play in the **forest ecosystem**. The **adaptive features** of the birds and insects promote **co-existence** so they can live together in harmony. Each is adapted to survive in its chosen **habitat** by carrying out its particular way of life, and in so doing each makes its contribution to the wider world of the forest ecology. There is an intimate relationship between the animals and the plants of the forest.

The invertebrates - worms, slugs, snails, spiders, centipedes and other insects-play important roles as scavengers, parasites, predators, pollinators and as a food source for other animals. New Zealand insects are quite unique and there are at least 10,000 different species. Insects choose the habitat that best suits their needs for food, reproduction and protection. They have adapted in shape, features and colouring in order to survive in the forest. For example the **stick insect** lives on branches and is camouflaged so well that a predatory bird cannot distinguish it from a twig.

Many different species of insects are found at every level of the forest, from the tops of the mountain beech trees to deep in the leaf litter on the forest floor. They have evolved so none are direct **competitors**. They may have different habitats and adaptations at different stages of their life cycles, like **moths**. There are insects that eat leaves and berries like **caterpillars, stick insects** and **wetas**. Their mouths are adapted for munching leaves. Have you heard the **cicadas** in the forest? Last century the Maoris called the Europeans "Pakeha he kihikihi" which means, "paleface making hissing sounds like the cicadas". Cicadas suck the sap of the plant roots. Some insects have a tube-like tongue to suck nectar. They help the plants by pollinating the flowers they visit. The flowers have nice scents to attract these insects to them.

Look on the forest floor. There is a whole new world down there. Many of the insects are found in the **leaf litter**, some **scavenging** on decaying vegetable matter and in rotting logs, like snails, while others are **predators** and eat other insects, like the **peripatus** which catches its prey by shooting out a jet of sticky threads and has remained unchanged for 600 million years. Other predatory insects, like the **dragon fly**, catch their food on the wing, and prey on the foliage-eating insects, thereby controlling the amount of vegetation that is eaten.

Water is the life blood of the forest, and many insects are dependent on forest streams for survival.

Birds are important in the whole pattern of survival. The forest is like a garden that produces food for the birds the whole year round. In their turn the birds scatter the seeds of the forest trees and plants and are therefore vital to the **regeneration** of the forest. Have you ever wondered why so many forest trees and shrubs have fat juicy berries to attract the bird's eye? The birds eat the berries of plants like bush lawyer, three finger, and stinkwood and the seed passes through the bird's gut to emerge with its droppings, away from the parent tree and by this process the forest spreads. Fleshy fruits containing the seed occur throughout the structure of the forest, from the highest trees, to the vines, to the plants of the forest floor. Birds like the **bellbird** suck nectar from flowers which helps in the pollination of the flowers. **Predatory birds** help to control the insect population. **Tomtits** feed on insects on the floor of the forest; **fantails** catch insects on the wing in the **subcanopy**; the **rifleman** eats insects in cracks and crevices on the trunk of the beech trees; **waxeyes** and **grey warblers** find their prey on the branches and twigs and leaves of the trees. (See bird section). Birds are found throughout all levels of the forest in their search for food but because they all have slightly different feeding requirements they do not get in each other's way. The forest and the birds need each other to survive.

The forest is home to all these different creatures and is vital to their continuing existence, just as the forest needs all its different inhabitants. The food chain that exists between the birds, insects and plants maintains a delicate balance in the forest ecosystem and any changes that

affect one part of the system will create disturbances that will be felt throughout the forest. Everything in nature is linked to everything else, and cannot be separated from its environment, and everything, even the tiniest insect, has its part to play in the ecosystem. As humans we have the power to destroy this fragile web of life. We must remember how important forests are, not just for our use, either as timber or for recreation, but for the benefit of the other creatures we share this planet with.