

# LINKING THE MOUNTAINS TO THE SEA CONSERVING NEW ZEALAND'S RIVERS

*One of nature's most awe-inspiring spectacles must be a river in full flow cascading through a gorge or down a waterfall. And one of nature's sharpest contrasts must be the same river at low flow meandering peacefully through pools and riffles. But, as KEVIN COLLIER explains, intact and unmodified river systems are becoming increasingly rare.*

**C**LEAN, FRESH WATER flowing from seepage to stream to lake and river and finally into the sea not only evokes emotions of awe and tranquillity, it also gives life to many species of native aquatic plants and animals.

The well-being of this native life, however, is often in conflict with the way in which we regulate and use rivers. Rivers are seen as convenient sources of water and electricity, as drains for the disposal of waste, and as natural hazards that need to be controlled. The role of rivers as habitat for native communities of plants and animals, and as part of the natural landscape of New Zealand, is one of the least recognised of their values.

**R**IVERS FUNCTION like huge trees, but instead of climbing towards the sun, they grow in size as they approach the sea. Small streams feed the main stem of the river like fibrous roots providing energy and

life. As with the fine root hairs of trees, wetlands and seepages keep the small streams alive. The intact sequence of wetland or seepage, stream, river and estuary is vital for the natural functioning of river ecosystems.

The existence of these intact linkages between different parts of a river is particularly important for many native fish. These are the fish which spend some of their lives in the sea and require access up and down rivers to complete their natural life-cycles (see page 30). Too often, humans do things that affect one part of a river or catchment without examining how this will influence life in other parts of the system. Dioxin and PCBs have leached into groundwaters in the Rotorua area, for example, and the insecticide dieldrin into Southland streams.

Close links with the land mean that the ecological health of rivers is greatly dependent on the state of the catchment and vegetation on the banks. The natural shape of river systems means that they have very long boundaries relative to the actual area of water. Consequently, there

is much greater scope for damage to rivers compared with forest blocks which have similar areas but shorter boundaries. Activities in the catchment such as mining, subdivision and farming can cause sediment, nutrients and toxic effluents to enter waterways. On the West Coast, for example, there have been recent problems with the discharge by mining companies of settling pond effluent into Inangahua River and Fletcher Creek.

The ability of rivers to dilute waste and transport it downstream has often been seen as a solution to pollution. This can create problems, however, because the pollutants move with the water and their effects on aquatic life can spread over long distances downstream. The Manawatu River has long suffered from the incremental effects of catchment erosion, industrial waste and sewage, farm runoff and the dewatering of tributaries. The result is that the lower section of the river is severely degraded, although a management plan to clean it up is now being developed by the regional council.

Native vegetation on the banks of rivers can help stabilise soil and prevent erosion, reduce nutrient runoff, and keep water temperatures down by providing shade. Many of our native aquatic plants are adapted to shaded conditions and have disappeared from streams where riverside forest has been removed. Plants alongside rivers also provide shelter for the adults of many aquatic insects, cover for native fishes and food in the form of leaves and terrestrial invertebrates that fall into the water. At least 14 native species of plants living on river banks are considered endangered, vulnerable or rare.

## Riverside vegetation

Native vegetation alongside rivers, lakes, swamps and estuaries is important to the natural functioning of aquatic ecosystems. It:

- maintains soil stability and reduces loss of land through streambank erosion
- regulates water flow by increasing the time water spends in the ground and the amount of water lost by plants
- maintains water quality and clarity and protects aquatic habitat by reducing sediment and nutrient run-off to waterways
- reduces maximum water tempera-

tures and minimises daily temperature fluctuations by providing shade

- influences energy dynamics by affecting the quality and quantity of light for the growth of algae and inputs of terrestrial organic matter for invertebrates
- provides cover and habitat for aquatic invertebrates and fish (in the form of leaf accumulations and woody debris), and for terrestrial plants and animals (e.g. bats)
- provides breeding and resting areas for many native birds (e.g. blue duck) and breeding areas for fish (e.g. whitebait).

*The mosaic of a modified landscape: the plain of the Waiau River, north Canterbury. The large aquifers that exist under braided rivers can become polluted from agricultural leachate, and irrigation of adjacent land can severely affect natural water flow.*