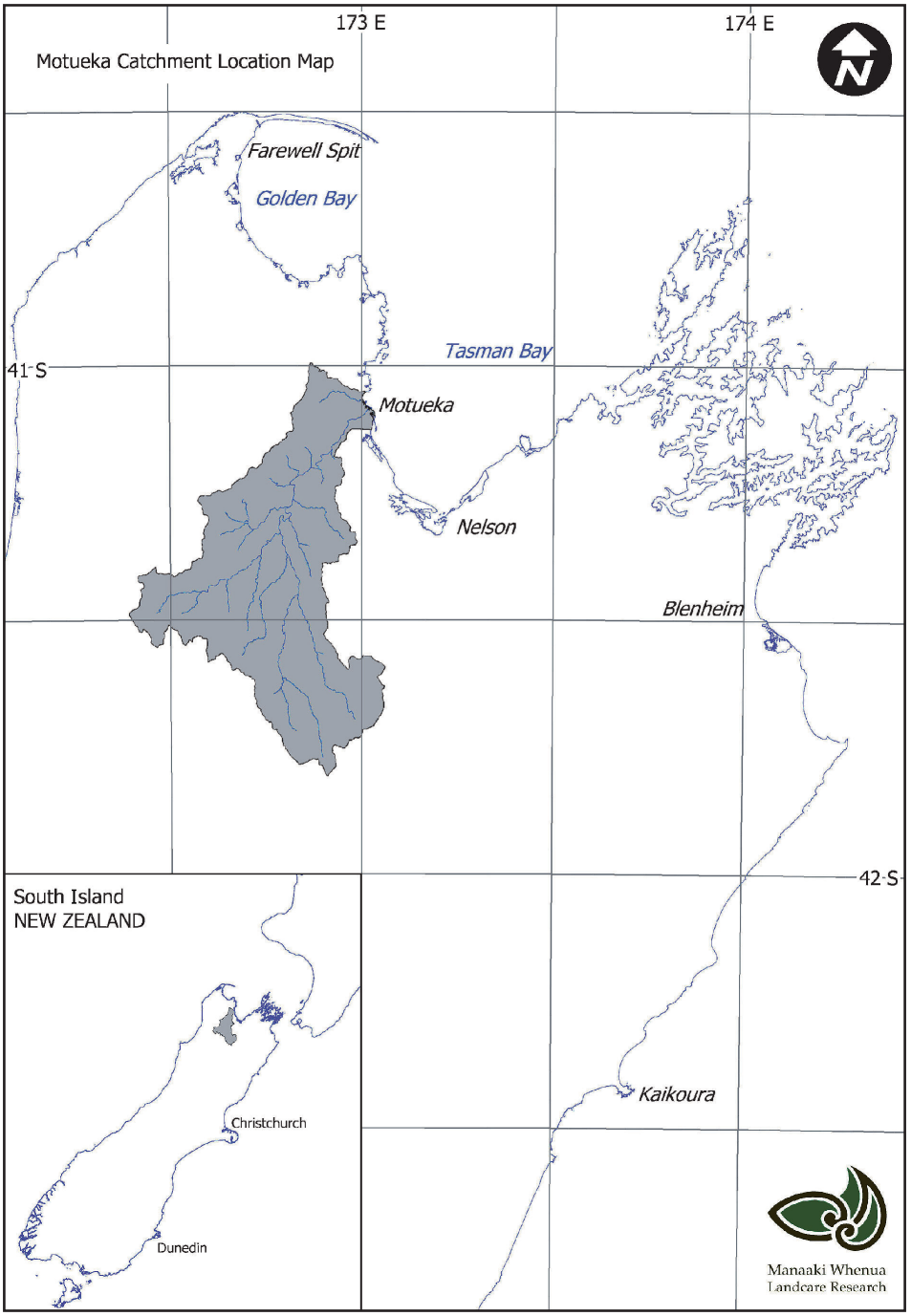
New Zealand

New Zealand-6: Motueka River



Introduction

New Zealand is situated in the Southwest Pacific Ocean, between latitudes 34° to 47° S and longitudes 166° to 179° E. It consists of three main islands, North, South and Stewart Islands, and a number of smaller isles. The country is long, 1,500 km, and narrow, average width 180 km, with altitudes, ranging up to 3,764 m in the Southern Alps of the South Island. New Zealand lies on a rather unstable portion of the boundary between the Indo-Australian and Pacific tectonic plates. Consequently the landscape is young, vigorous and tectonically active. Earthquakes are not uncommon and there is an active volcanic zone. Rivers are short, steep and can carry high sediment loads. The climate exhibits a marked maritime influence. The weather is a mixture of anticyclones that bring clear skies, depressions in the form of frontal rainfall from the west and south, and the occasional cyclone that moves down over the country from the north. Most of New Zealand gets between 600-1,500 mm of rain per year. In the South Island, warm wet westerly winds are cooled and condensed as they rise over the Southern Alps to form orographic conditions. On the western side of the Alps rainfall can exceed 10,000 mm per year. The mean annual sea-level air temperature varies from 15°C in the north to 9°C in the south. Much of New Zealand receives over 2,000 hours of sunshine per year. Winter snowfall can occur at higher elevations in the North Island, and down to sea level in parts of the South Island. About 50% of the land area is in pasture and 30% in protected-indigenous and commercial forests. The population is a little over 4 million, of which about 3 million live in the North Island.

The New Zealand river catalogued in this volume is the Motueka River. This river basin is in the north of the South Island, about 40 km west of the city of Nelson (population 41,500 (2001)). The Motueka River drains 2,076 km^2 and provides the major freshwater flow into Tasman Bay, a productive, shallow water body of high economic, ecological and cultural significance. The elevation range is from sea level to 1,875 m at Mt Owen, in the Arthur Range on the catchment's western boundary. There is a strong rainfall gradient across the catchment, ranging from 3,500 mm in the west to about 950 mm in the east. Mean annual rainfall is around 1,600 mm with marked wet (winter) and dry (summer) seasons. The river has a mean annual runoff of 844 mm and a mean annual flow of 59 m^3/s, as measured at Woodstock, 36 km upstream from the mouth. There is a dominance of mountainous and hilly terrain within the catchment, with limited, but agriculturally important areas of flat terraces and flood plains. Land-use is dominated by indigenous (35%) and commercial (25%) forests, and pastoral farmland (20%). Horticulture occupies a small (0.6%), but expanding area, and is a major user of both surface and groundwater, particularly during late summer. Over much of the catchment demand for water exceeds supply, resulting in competition between land-uses, i.e., horticulture and forestry, and between out-of-stream uses and maintenance of in-stream values.

The Motueka catchment is the focus of a 6-year research programme aimed at improving the management of land and water resources by adopting an integrated catchment management (ICM) approach. The major resource management issues within the Motueka include water resource allocation, water quality and quantity, habitat quality and land and coastal productivity. The ICM approach takes a "ridge top to the sea" perspective to provide a framework for understanding the cumulative interactions of past, present, and possible future uses of land, freshwater and marine resources.

Acknowledgements

Alex Watson, from Landcare Research (Lincoln), compiled this report, with the help of Tim Davie, Les Basher and James Barringer of the same organisation. Data has been sourced from published material (see Section 7) and the Landcare Research archives. We would like to thank: Martin Doyle of Tasman District Council, Richmond, for generously allowing access to their meteorological and hydrological data-bases, Roger Young of Cawthron Institute, Nelson for the water quality data in Section 5.5. This report has been funded by the Foundation for Research, Science and Technology, under contracts C09X0014 and C09X0214.