An evaluation of the ecology and riparian management of the south branch of the Whareroa Stream, Paekakariki

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Abstract

Whareroa Farm, Mackays Crossing, Paekakariki, was bought by the Department of Conservation in 2005. The goal was to effect the restoration of a corridor for flora and fauna from the Akatarawa Forest in the east to Queen Elizabeth Park and the sea in the west. The south branch of the Whareroa Stream, which arises as a series of tributaries from a ridge 272m above sea level, traverses Whareroa Farm and the adjacent Queen Elizabeth Park. It was thought likely that the stream had been severely affected ecologically during a century of cattle and sheep farming, though the degree to which the ecological degradation had occurred was unknown. Obvious deforestation and land use changes suggested that, in concert with many other New Zealand hill country farms, the ecological changes would be significant.

To establish and quantify the degree of degradation, the Auckland Regional Council (ARC) Stream Environment Valuation (SEV) protocol was applied to the Whareroa Stream and its tributaries. Five sites were selected for valuation, varying from open pasture to bush covered and open parkland. The resulting SEV scores showed losses of ecological value ranging from 32% to 46% across the sites.

The Macroinvertebrate Community Index (MCI) and the fish Index of Biological Integrity (IBI) were measured at each site. Results indicated that aquatic habitats were unable to sustain adequate assemblages at four of the five sites.

The valuations of the riparian zones at each site used the River Environment Classification (REC) and Riparian Management Classification (RMC) protocols. The results indicated that current riparian characteristics showed poor to absent effective riparian zones from the headwaters to the sea at all sites. Riparian zones are pivotal to the provision of stream ecological integrity and are responsible for maintaining the longitudinal, lateral and vertical connectivity between a stream, its network and its surrounding land. The loss of in-stream organic matter from lack of riparian vegetation together with the loss of effective temperature control from lack of shade, impacts negatively on the habitats for macroinvertebrates and fish. This was highlighted in the Whareroa Stream network.

While the SEV and RMC evaluations showed that, with best practice management plans, there was great potential for improvement of the Whareroa Stream ecology, any riparian restoration would require sympathetic and improved fencing, withdrawal of stock from stream access and the retirement of headwater land from pastoral use. The loss of ecological integrity that occurs as a result of prolonged land use changes from forest to agriculture is well illustrated by the situation in the south branch of the Whareroa Stream and its tributaries.

Explanation of text

This thesis will be presented as two papers with a general introduction. Some of the information will be presented in both Chapters 2 and 3 where this is relevant. Inevitably this will lead to some repetition.

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