

Between Rocks and other Hard places: the importance of substrate in restoring stream invertebrate communities

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When restoring a stream, addition of rocks or wood may be a vital factor in encouraging recolonization by aquatic insects.

Aquatic insects, in the adult phase, are aerial. In previous studies, we found that some aquatic insect species use emergent structures (rocks and wood with tops protruding above the water) as a preferred habitat to lay their eggs. In addition, we found that other aquatic insect species use emergent structures for a variety of possible reasons, including courtship, mating, resting (all related to egg-laying) and emergence (Smith et al. this conference). Many adult insects appear to use emergent structures to transition from terrestrial to aquatic habitat. Without emergent rocks some insect species may not be able to complete their life cycle. Data and photographs from recent Regional Council field site visits to over 500 North and South Island stream sites have been collated to compare the availability of emergent structures with the presence/abundance of aquatic insect species.

We will present the association between presence/abundance of emergent structures and the species composition of the benthic larval community. Statistical models factored out spurious relationships with streamside vegetation, shade, surrounding land use, substrate size, flow type, velocity, periphyton and macrophyte cover. We will also show associations between presence/abundance of emergent rocks and surrounding land use, determining whether lack of emergent habitat may limit insect oviposition in pasture streams.

Streamside vegetation is well known to be an important component of stream restoration projects for aquatic insects, whose life history stages (eggs, larvae, pupae, adults) require suitable terrestrial, as well as aquatic, habitat. However, the importance of suitable habitat for facilitating the transition from terrestrial to aquatic life stages is poorly-known and may prove critical. In this case, emergent structures may need to be added in some stream restoration projects to restore insect communities.