

The rocky pathway to restoring aquatic insect communities

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Aerial adult aquatic insects are obliged to return to the water to oviposit. Stream rehabilitation projects typically focus on in-stream larval habitat neglecting to provide suitable habitat for reproductive stages. The importance of recruitment limitation in population dynamics has been demonstrated in terrestrial and marine communities, and therefore an absence of suitable oviposition habitats could limit recovery of freshwater insect communities.

Our previous work has shown some adult aquatic insects exhibit highly selective oviposition behaviour, with a preference to oviposit on emergent rocks (rocks that partially protrude out of the water). To determine whether other species also use emergent rocks, we coated instream emergent rocks with sticky Tanglefoot®. We found many adult aquatic insects on instream emergent rocks but almost none on “control” rocks a few centimetres away on dry gravel bars. These data suggest emergent rocks are not only important sites for oviposition but also for other behaviours (e.g., emergence, resting, courtship, mating). In a separate survey we found that emergent rocks were more abundant in native forest streams than pasture streams, but egg masses were overall more common in pasture streams. The data suggest emergent rocks in pasture streams may be in limited supply, and therefore more sought after by adult females for oviposition.

Finally, we investigated whether streams with abundant emergent rocks/wood have a different species composition to streams without. We will present correlations between reach-scale benthic community data and emergent rock presence/abundance, determined from a photographic survey of 500 State of Environment monitoring sites.

Understanding the reproductive requirements of aquatic insects is fundamental to understanding the sustainability and resilience of aquatic ecosystems, as well as predicting outcomes of aquatic restoration projects. Our data to date suggest that stream restoration projects need to provide suitable habitat for all life cycle stages to re-establish a diverse insect community.