

Healthy Rivers, Healthy Communities
Presenting current research in the Goulburn Broken Catchment

Habitat restoration in degraded rural streams: the Granite Creeks project

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Abstract:

European settlement in Australia was followed by extensive clearing, grazing and stream channelisation, causing severe erosion, channel incision, and subsequent downstream sedimentation. In many regions the deposition of granitic sands created sand slugs, extensive geomorphic features in which deposited sediment inundates stream channels over many kilometres, burying large timber and creating shallow, habitat bereft stream sections. Sand slugs are widespread in southeastern Australia, as well as in many other parts of the world.

The Granite Creeks project represents a case study in how habitat structure might be restored in streams degraded by sand slugs. In an attempt to increase habitat complexity, large timber structures were introduced into two streams to promote the formation of scour pools for fish, and to provide substrates for colonisation by biofilms and invertebrates. Extensive monitoring of these sites has tracked both the short and long-term dynamics of scour around the wood structures (see talk by Dan Borg) as well as changes in the fish and invertebrate fauna relative to un-manipulated control sites.

Key Findings:

- Invertebrates and biofilms rapidly colonised timber structures, but colonising species reflected the resistant fauna already present at sites, perhaps suggesting a depleted regional species pool. Fish responded to the structures in the short-term, although abundances were highly variable, probably due to stochastic and patchy recruitment, and possibly also high levels of temporal variation in the level of scour around individual timber structures. In the longer-term, extended drought severely compromised the effectiveness of these manipulations by causing extensive stream drying.

Summary:

- Thus, while the addition of timber to sand-slugged streams may be a useful restoration strategy, this recommendation is highly contingent upon the presence of sufficient stream flows, and even then results may still be highly variable. Where flows are less reliable, attention would be better diverted towards management interventions capable of restoring and protecting specific drought refuge habitats. We suggest that currently this is a relatively unexplored but crucial area of habitat restoration in Australian lowland streams.