

Restoring De-watered Riparian Ecosystems: Role of Soil Seed Banks

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ABSTRACT

Desert rivers have highly variable flow regimes, with intense floods and short-lived resource pulses. Their floras thus are dominated by species with short life cycle but long-lived seeds. Some projects are underway to restore riparian ecosystems to dewatered river reaches. We summarize three studies designed to address the role of soil seed banks in such restoration projects. The first study showed that despite decades of diversion, one riparian zone downstream of a dam had viable soil seed banks, with composition and diversity similar to a reference river (but with shifts toward upland species). The second study, along a dewatered urban river, showed that small pockets of riparian vegetation developed at storm drain outflows, with diversity and composition (of seed banks and vegetation) similar to above-dam control sites. A third study showed that landscape position can influence seed banks, with some dry reaches in close proximity to wet reaches having greater densities of wetland seeds than those located farther away from resource-rich areas. Restoration implications are: 1) viable seed banks in dry reaches may obviate the need for seed augmentation (for particular functional groups) in conjunction with flow restoration; 2) restoration efforts should address landscape context and connectivity, focusing on sites with abundant seed inflow (i.e., those near wet reaches or draining diverse watersheds); 3) studies are needed to determine the decay rate of seed viability in dewatered reaches, as this will set the length of the 'revegetation potential' window.