

Deliver resilience before planting by seizing a one-off chance

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Most forest and roadside restoration involves planting nursery-raised seedlings into areas that are cleared or sprayed of competing growth. Where engineered landforms are constructed, living (pasture) or organic mulches may be spread to stabilise the earth-worked surface, reduce competition and conserve soil-water. Opportunities to enhance the resilience of such areas by re-using on-site resources and enhancing micro-site diversity are routinely missed. We give examples where such opportunities have been seized. We identify what allowed these innovative actions (how barriers were overcome) in mine rehabilitation, green (stormwater) infrastructure construction and urban forest restoration.

* Re-use of on-site resources. In level landscapes, upturned root plates of killed weed-trees with attached soil and trunks are used to form shelter, habitat and perching sites. Recycled concrete and rock piles create outcrops that shed runoff and maintain open epiphyte zones at ground level. Recycled living trees and epiphytes with intact soils provide immediate structure and inoculants. Many of these features may accelerate faunal recolonization.

* Enhancing micro-site diversity. Root systems naturally integrate soil conditions at a fine scale. Hence resilience to climate change can be enhanced by accentuating wetter and drier sites at a fine scale using micro-topography (spot mounding and coarse wood placement), variable rooting and soil depth, soil amendments and mulch depths, and controlling the direction and quantity of drainage. Examples include terrestrial orchid habitat and Powelliphanta refugia.

We suggest guidance for restoration (of earth-worked sites in particular) needs to explicitly require works that enhance the underlying resilience and heterogeneity of rehabilitated areas. Building on natural moisture gradients reduces reliance on plants alone to create structural and landscape heterogeneity. Heterogeneity can be difficult to specify in a contract, and is best supported by on-the-ground interaction between landscape architect/ecologist helping earthworks personnel provide initial templates and reinforce permission to create 'wild' surfaces.