

HOW PRECISELY DO WE NEED TO MATCH TOPSOIL TO SITE FOR SUCCESSFUL RESTORATION OF POST-MINING ENVIRONMENTS? – A CASE STUDY FROM WETLANDS IN SOUTH-WESTERN AUSTRALIA.

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Harvesting and relocation of topsoil has become a standard and often highly successful technique for restoring post-mining landforms. Best practice involves minimising storage times for harvested topsoils, which often implies transporting topsoil to other post-mining landforms. Native wetland communities show complex spatial patterns, including mosaics and gradients, often driven by geomorphic and hydrological patterns. Therefore, how closely in terms of bio-physical environment do the topsoil source and receiving sites need to be? Although it may be advantageous to closely match source and receiving sites, logistical and cost constraints may instead favour the use of a more general topsoil/seed mix. These ideas were tested at a silica sand mine in south-western Australia where mining occurs below the regional watertable and the post-mine landscape consists of dredge ponds with surrounding slopes. Monitoring over several years has confirmed the benefits of using fresh topsoil (c.f. seeding and/or planting approaches). Generally topsoil was from seasonal wetlands and restoration was most successful in the zone from the littoral edge of rehabilitated dredge ponds to 2 m vertically above. Floral communities above this level were poor in plant species and cover. Flooded zone areas recolonised quite readily with native sedges and rushes. Shifts in species composition in most recent rehabilitation was evident with upland species surviving more readily on upper rehabilitated slopes and corresponding loss of more typical wetland species in these upland areas over time. Plant communities of lower slopes showed the converse pattern of development. In conclusion, matching topsoil to site does improve restoration success when applied at coarse spatial scales, however may not be necessary at finer scales.