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Assessing the success of experimental rehabilitation on a coastal mineral sands mine in Namaqualand, South Africa

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Abstract

The success of different rehabilitation treatments following surface mining on the arid west coast of South Africa was assessed. Treatments consisting of one or a combination of topsoil addition, plant translocation and seeding were applied to experimental rehabilitation sites in 2001, while the treatment of another site in 2008 combined all three techniques. Vegetation and species cover, species richness, diversity and evenness, and grazing capacity of rehabilitation sites were sampled during winter 2009 and summer 2010, and compared with a reference site. All rehabilitated sites achieved the objective to attain a minimum grazing capacity of 20 ha per small stock unit. Rehabilitation trials were successful in establishing a vegetation cover, but were unable to return species richness and diversity to reference levels and did not resemble the reference site in species composition. Common species in reference sites were absent or only occurred in low numbers. No treatment outperformed the others and further experimentation is needed to determine the most suitable combination. It is recommended that rehabilitation should be done in multiple stages in future to improve seedling survival and to return species that are unable to establish in the adverse conditions present at the onset of rehabilitation.