

Seagrass restoration off metropolitan Adelaide

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More than 5,200 ha of seagrass were lost off Adelaide between ~ 1940 and 2002, primarily due to nutrient inputs. Improved wastewater management since has reduced nitrogen inputs from 2,400 to 600 tonnes p.a., leading to some natural recovery (~ 4 %). To improve recovery, traditional seagrass rehabilitation methods of transplants and seedling propagation were tested and largely failed due to relatively strong hydrodynamic forces and extensive bioturbation. A fortuitous and novel combination of simple engineering and a biological peculiarity, however, produced encouraging results, whereby hessian bags were used to entangle the 'grappling hook' apparatus possessed by seedlings of the seagrass *Amphibolis antarctica*. Experimental scale deployments have resulted in patches of seagrass that look like, and appear to function like, natural *Amphibolis* meadows. As a consequence, large-scale (1 hectare) trials are now underway. While highly successful at small scales, this technique is not currently applicable to a broad range of other seagrass species. Initial trials implanting *Posidonia* seedlings into the bags have, however, also proved successful. Seedling survival over 2 ½ years ranged from 15-60% depending on fill type for bags seeded in early 2012, and after 3 years it was no longer possible to distinguish individual plants, which had spread through the production of rhizomes. Over this time period, plants grew to ~25-30 cm in height. While successful, the major disadvantage of this technique for species such as *Posidonia* is that it requires divers to plant the newly sprouted seedlings into bags, which is time consuming. It remains to be determined if bags can be pre-seeded prior to deployment, which would remove the need for divers.