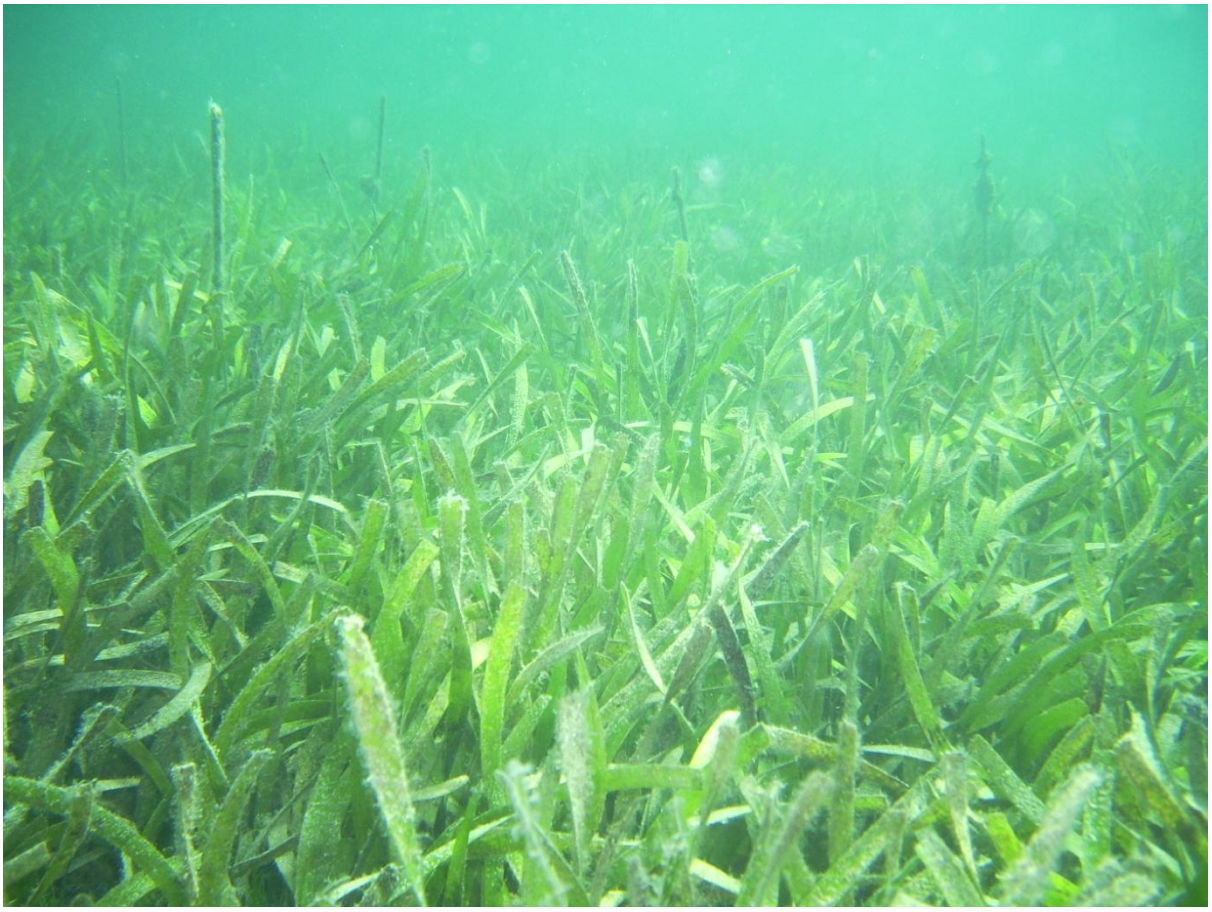
Assessing Ecosystem Recovery in Transplanted *Posidonia australis* at Southern Flats, Cockburn Sound



Ian Dapson

Murdoch University

School of Biological Sciences

2011

Declaration

This thesis is an account of my own research and has not been previously published or submitted at any tertiary institution, except for where acknowledgement has been made in the text.

Ian Dapson

November 2011

Abstract

Following on from the large scale loss of seagrass in Cockburn Sound and extensive transplanting of *Posidonia australis* which had taken place on Southern Flats, assessment of the recovery of the seagrass benthic infauna ecosystems was undertaken. Samples from the outer, middle and centre edge zones of four different density transplant plots (1 m, 0.5 m, 0.25 m and 0.125 m spacing) located within a larger transplantation meadow were compared against two natural meadows and a bare sand site. Four years after transplantation the 0.25 and 0.125 m Plots had shoot densities comparable to those of the natural seagrass sites with a two-way ANOVA revealing significant effects of site and edge zone on the seagrass shoot density. Total infauna abundance and infauna assemblages within the 0.25 and 0.125 m Plots had reached equivalent level to the natural meadows but not at the 1 and 0.5 m Plots. A two-way ANOVA showed a significant difference in the total infauna abundance between the different sites but no significant edge effect was detected. Eusiridae, Solecurtidae, Diogenidae, Columbellidae, Fissurellidae, Oweniidae and Ischnochitonidae were found to occur in the two natural meadows and in the 0.25 and 0.125 m Plots and may be climax or K-species indicating the recovery of the transplanted seagrass to natural levels. The transplanted seagrass was also found to support small numbers of pipefish, seahorses and a sea lion. From this study it can be seen that the shoot densities and infauna abundances and assemblages of the 0.25 and 0.125 m Plots have reached levels comparable the nearby natural meadows and that those of the 1 and 0.5 m Plots are likely to reach comparable level another in one to two years.

Acknowledgements

I wish to thank both my supervisors Dr Jennifer Verduin and Dr Mike Van Keulen for suggesting the project and helping with the field work, as well as their constructive feedback on my work.

I would also like to thank Rhiannon Jones, Steve Goynich, Anka Seidlitz and Mike Taylor for their assistance with skippering the boat and assisting with the diving (sorry about the cold Steve!). A special thanks to Rhiannon Jones for her assistance with launching and skippering the boat which provided much amusement during the very cold and wet field work.

For their assistance with the arduous task of sorting the infauna I would like to express my gratitude to Aurelie Labbe, Alisia Lampropoulos and Holly Poole. Without their help I would probably still be in the lab sorting infauna.

My thanks to Andrew Hosie, Stacey Osborne and Genefor Walker-Smith for their assistance with identifying some of the tricky infauna and putting me on the right track, and additional thanks to Dr Michael Rule, Dr Glenn Hyndes, Dr Keith Martin-Smith, Dr Anne Brearley and Dr Ryan Admiraal who offered their advice on how best to tackle the project.

To all my family and friends who offered their support and encouragement throughout the year, thank you.

Contents

List of Figures

List of Tables