TRANSPLANTATION OF *Halodule pinipolia* USING SHELL AS ANCHORING DEVICE IN SETIU, TERENGGANU

GAN SZE HOON

FACULTY OF MARITIME STUDIES AND MARINE SCIENCE
UNIVERSITI MALAYSIA TERENGGANU
2011

Transplantation of Halodule pinifolia using shell as anchoring device in Setiu, Terengganu / Gan Sze Hoon.

DEPARTMENT OF MARINE SCIENCE
FACULTY OF MARITIME STUDIES AND MARINE SCIENCE
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DECLARATION AND VERIFICATION REPORT

FINAL YEAR RESEARCH PROJECT

It is hereby declared and verified that this research report entitled:

Transplantation of *Halodule pinifolia* Using Shell as Anchoring Device in Setiu, Terengganu by **Gan Sze Hoon**, Matric No. **UK 17084** have been examined and all errors identified have been corrected. This report is submitted to the Department of Marine Science as partial fulfillment towards obtaining the Degree of Bachelor of Science (Marine Biology), Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

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By
Gan Sze Hoon

Research Report submitted in partial fulfilment of
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LIST OF SYMBOLS, ABBREVIATIONS OR NOMENCLATURES

%	-	percentage
US$	-	United States Dollar
ha	-	hectare
m	-	metre
GPS	-	Global Positioning System
g	-	gram
mm	-	millimetre
PE	-	polyester
PVC	-	polyvinyl chloride
°C	-	degree Celsius
cm	-	centimetre
DW	-	dry weight
NTU	-	Nephelometric Turbidity Unit
ppt	-	part per thousand
ppm	-	part per million

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ABSTRACT

Seagrass transplantation has long been conducted to mitigate the global loss of seagrass meadows. However, most of the transplantation methods described by previous researchers for restoration or rehabilitation are not applicable in large scale restoration projects due to labour and cost constraints. Furthermore, most of the described methods focused mainly on temperate species. This study was done in order to test the applicability of a new transplantation method using shell as anchoring device on the tropical species, *Halodule pinifolia*. Planting units consisting of three continuous shoots on a rhizome anchored to one oyster or scallop shell were placed on the sediment at transplanting site. Four transplanting plots were prepared, each with 15 oyster shell planting units and 15 scallop shell planting units. Transplantation was conducted at Setiu Wetlands in July 2010 until October 2010. Transplants were considered established after 2-3 months when they were morphologically (shoot height) and physically (aboveground biomass) similar to the natural populations, but the survival obtained were low. At the end of experiment, survival of transplants in the four plots ranged from 0.0% to 5.6%. Decline in number of shoots when nearer to end of experiment would be because it was close to the senescence period of natural meadows in Setiu Wetlands. Higher oyster shell planting unit survival suggests that flat and heavier shells provide better anchorage and assist the establishment of transplants in the initial period though growth was independent of shell types after establishment. This experiment proved that the shell method is effective in terms of

time, labour and cost. Regarding the effectiveness in transplant survival, similar experiments should be repeated right after the monsoon season in Setiu to reassess the transplant survival aspect.

Transplantasi *Halodule pinifolia* dengan Menggunakan Cangkerang sebagai Pemberat di Setiu, Terengganu

ABSTRAK

Transplantasi rumput laut telah lama dijalankan untuk memampas pengurangan padang rumput laut yang berlaku di seluruh dunia. Namun, kebanyakan kaedah transplantasi dalam pemulihan padang rumput laut yang digambarkan oleh para penyelidik sebelum ini adalah tidak sesuai untuk diaplikasikan dalam projek pemulihan berskala besar disebabkan kendala dalam tenaga kerja and kos. Selain it, sebahagian besar daripada kaedah tersebut hanya fokus pada spesies di kawasan beriklim. Maka dengan itu, kajian ini dijalankan untuk menilai keberkesanan kaedah transplantasi baru yang menggunakan cangkerang sebagai pemberat ke atas spesies di kawasan tropika, *Halodule pinifolia*. Unit penanaman terdiri daripada tiga pucuk yang berterusan pada rimpang melintang dengan satu cangkerang tiram atau kerang dan ditanam dengan meletakkannya ke atas sedimen di tapak penanaman. Empat plot telah ditanam, masing-masing dengan 15 unit penanaman daripada cangkerang tiram dan 15 unit penanaman daripada cangkerang kerang. Transplantasi ini dijalankan di Tanah Bencah Setiu dari Julai 2010 sampai Oktober 2010. Tanaman dikatakan berjaya mengakar dan tumbuh apabila mereka tidak mempunyai perbezaan dari segi morfologi (tinggi pucuk) dan fizikal (biojisim atas permukaan tanah) dengan populasi semulajadi selepas 2-3 bulan, walaupun kadar kemandirian yang diperolehi adalah rendah. Pada akhir eksperimen, kadar kemandirian pucuk berbeza dari 0.0% hingga

5.6% dalam empat plot yang ditanam. Jumlah pucuk mengurang pada akhir eksperimen kerana masa itu mendekati tempoh penuaan padang rumput laut di Tanah Bencah Setiu. Kadar kemandirian yang tinggi dalam unit penanaman cangkerang tiram menunjukkan bahawa cangkerang kerang yang datar dan lebih berat dapat memegang pucuk dengan lebih berkesan dan membantu dalam penembusan akar pada tempoh awal walaupun pertumbuhan rumput laut selepas pengakaran tidak bergantung kepada jenis cangkerang yang digunakan. Kajian ini membuktikan bahawa kaedah cangkerang adalah berkesan dari segi masa, tenaga kerja dan kos. Untuk penilaian semula bagi keberkesanan dari aspek kadar kemandirian, eksperimen yang sama harus diulang pada masa selepas musim monsun di Setiu.