

# Table of Contents

<b>ABSTRACT .....</b>	<b>IX</b>
<b>INTRODUCTION .....</b>	<b>1</b>
Consultancy Brief .....	1
Site Description .....	1
General Seagrass Ecology .....	2
Shoalwater Bay seagrasses .....	2
<b>METHODS.....</b>	<b>2</b>
Survey Methods .....	2
Macrofaunal communities .....	3
Geographic Information System .....	4
Analysis .....	5
<b>RESULTS.....</b>	<b>8</b>
Seagrass species, distribution and abundance .....	8
Seagrass depth distribution .....	21
Seagrass monitoring .....	22
Associated Macrofauna .....	23
<u>Invertebrates</u> .....	<u>23</u>
<i>Penaeid</i> prawns .....	23
<i>Other invertebrates</i> .....	26
<u>Fish</u> .....	<u>28</u>
Associated Megafauna.....	31
<b>DISCUSSION .....</b>	<b>32</b>
Seagrasses .....	32
Prawns and Fish .....	33
Dugongs .....	33
Seagrass Monitoring .....	34
<b>ACKNOWLEDGMENTS.....</b>	<b>35</b>
<b>REFERENCES .....</b>	<b>36</b>
<b>APPENDIX 1 .....</b>	<b>39</b>
<b>APPENDIX 2 .....</b>	<b>39</b>

## List of Figures

Figure 1. Location of Shoalwater Bay study area.....	1
Figure 2. Above-ground biomass for each meadow type in September 1995 and April 1996.....	20
Figure 3. Mean and range of above-ground biomass for each seagrass species in the survey area (all sites pooled) in September 1995 and April 1996.....	20
Figure 4. Means, standard errors and ranges of depth of occurrence for each seagrass species of Shoalwater Bay.....	21
Figure 5. Percentage of total individual penaeids collected at each beam trawl site in September 1995 and April 1996. ....	23
Figure 6. Abundance of penaeid prawns at each trawl site in September 1995 and April 1996.....	23
Figure 7. Number of species present at each site in September 1995 and April 1996.....	25
Figure 8. Percent species composition of penaeid prawns at each trawl site. ....	25
Figure 9. Composition of fishery value for penaeids collected from beam trawls in September 1995 and April 1996 (all sites pooled). ....	26
Figure 10. Percent fishery value composition of penaeids at each trawl site in September 1995 and April 1996. ....	26
Figure 11. Percentage composition of invertebrate groups to the total biomass (g DW.) at each beam trawl site in September 1995 and April 1996.....	27
Figure 12. Composition of total beam trawl catch at each site in September 1995 and April 1996.....	28
Figure 13. Abundance of fish at each trawl site in September 1995 and April 1996.....	28
Figure 14. Percent composition of each family of fish collected at each trawl site in September 1995 and April 1996.....	31
Figure 15. Composition of fishery value for fish collected from beam trawls in September 1995 and April 1996 (all sites pooled). ....	31

## List of maps

Map 1.	<i>Location of survey sites within the Shoalwater Bay survey area, September 1995.</i>	6
Map 2.	<i>Location of survey sites within the Shoalwater Bay survey area, April 1996.</i>	7
Map 3.	<i>Distribution of seagrass meadows in the Shoalwater Bay survey area - September 1995.</i>	10
Map 4.	<i>Distribution of seagrass meadows in the Shoalwater Bay survey area - April 1996.</i>	11
Map 5.	<i>Seagrass distribution in West Bight and along the western and southern sides of Shoalwater Bay - September 1995.</i>	12
Map 6.	<i>Seagrass distribution in West Bight and along the western and southern sides of Shoalwater Bay - April 1996.</i>	13
Map 7.	<i>Seagrass distribution in Canoe and Strong Tide Passages in Shoalwater Bay - September 1995.</i>	14
Map 8.	<i>Seagrass distribution in Canoe and Strong Tide Passages in Shoalwater Bay - April 1996.</i>	15
Map 9.	<i>Seagrass distribution in East Creek and Georges Creek of Shoalwater Bay - September 1995.</i>	16
Map 10.	<i>Seagrass distribution in East Creek and Georges Creek of Shoalwater Bay - April 1996.</i>	17
Map 11.	<i>Seagrass distribution in Island Head Creek and Port Clinton - September 1995.</i>	18
Map 12.	<i>Seagrass distribution in Island Head Creek and Port Clinton - April 1996.</i>	19

## List of tables

Table 1.	Description of beam trawl sites in the Shoalwater Bay survey area. ....	4
Table 2.	Ranks of mapping quality for seagrass meadows mapped in Shoalwater Bay. ....	5
Table 3.	Mean above-ground biomass, number of individual meadows, and distribution for each seagrass meadow type identified in September 1995 and April 1996. ....	9
Table 4.	Number of sites sampled, mean above-ground biomass, precision and distribution of each monitoring meadow in Shoalwater Bay - September 1995. ....	22
Table 5.	Number of sites sampled, mean above-ground biomass, precision and distribution of each monitoring meadow in Shoalwater Bay - April 1996. ....	22
Table 6.	Species, fishery code, carapace length and abundance of penaeid prawn species collected by beam trawl from Shoalwater Bay - September 1995 and April 1996. ....	24
Table 7.	Taxa, abundance, size data and value codes for fish collected from Shoalwater Bay beam trawl sites (all sites pooled). ....	29
Table 8.	Results of linear regressions of each diver's biomass estimation with harvested above-ground biomass ( $\text{g dry wt. m}^{-2}$ ) in September 1995 and April 1996. ....	39
Table 9.	Results of 2-way ANOVA for penaeid abundance between sites and years. ....	39
Table 10.	Results of 2-way ANOVA for number of penaeid species between sites and years. ....	39
Table 11.	Results of 2-way ANOVA for number of fish between sites and years. ....	39