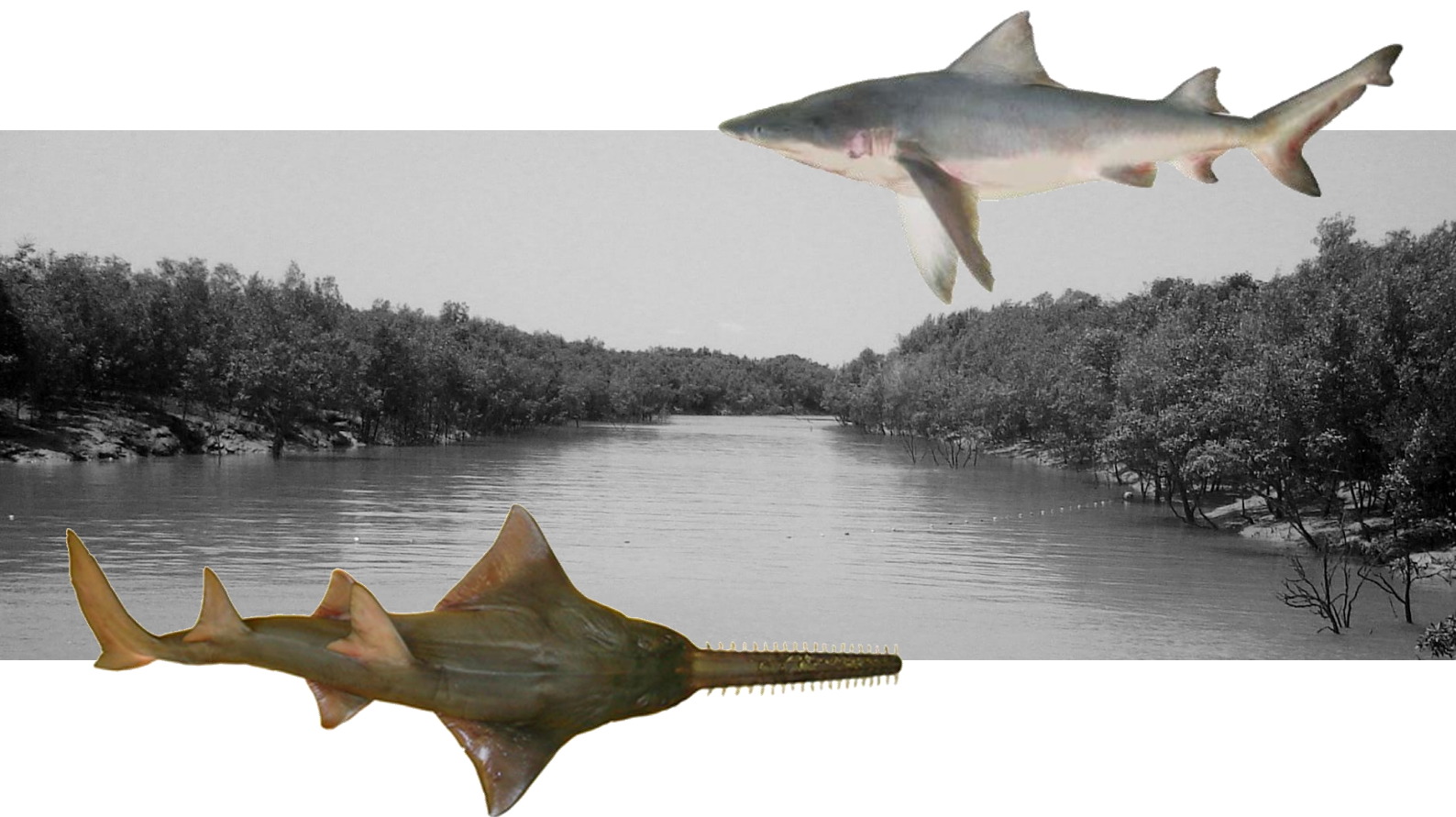


**Utility of a multi-faceted approach in  
determining the habitat use of endangered  
euryhaline elasmobranchs in a remote region of  
northern Australia**



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This thesis is presented for the degree of Master of Philosophy of Murdoch University

2011

## DECLARATION

I declare that this thesis is my own account of my research and contains as its main content work that has not previously been submitted for a degree at any tertiary education institution.

.....

Jeff M. Whitty

2011

Frontispiece: *P. microdon* and *G. garricki* photos by Dean Thorburn

## Abstract

The overriding aim of this thesis was to explore the habitat use of the critically endangered freshwater sawfish (*Pristis microdon*) and northern river shark (*Glyphis garricki*) in the remote Kimberley region of northern Western Australia. This information has been largely lacking and is critical for the management and conservation of these species. Habitat use of these species was documented through the use of long-term catch, environmental and tagging (conventional, acoustic and satellite) data, which was acquired between 2005 and 2009 in the Fitzroy River and King Sound, Western Australia. Monitoring of the various environmental parameters demonstrated that the study area is extremely dynamic, with significant seasonal changes in abiotic variables such as water flow, depth, temperature, turbidity and salinity. Catch data demonstrated that juvenile *P. microdon* inhabit the Fitzroy River for three to five years, at which time individuals begin to emigrate from the river, prior to maturation. Catch data also demonstrated that juvenile and adult male *G. garricki* inhabit highly turbid nearshore waters throughout the upper King Sound. Relative abundance of *P. microdon* in the river varied seasonally and annually, and differed between size classes. A decrease in relative abundance between the early and late dry season, which was only significant with young of the year *P. microdon*, was attributed to mortality as well as dispersal of individuals. Catches of *G. garricki* were rare, although this species was relatively abundant in highly turbid waters in King Sound. Foraging, depth use and inter-pool movements of *P. microdon* in the Fitzroy River were influenced by depth, flow and light intensity/turbidity and potentially by salinity and/or water temperature. However, the response to environmental variables differed between *P. microdon* size classes, possibly due to differences in trophic and

habitat requirements of the various size classes. Results from this study demonstrated that *P. microdon* is sensitive to environmental change, but appear to endure/recover from short-term (months) negative impacts through behavioural regulation. It is not possible at this time to positively conclude about the impacts of specific environmental changes on *G. garricki* habitat use, due to the limited data from *G. garricki* captures and tagging. However, as all *G. garricki* captured in this study were observed to inhabit tidal creeks and river mouth areas, the destruction of such areas or restriction to and from such areas is likely to negatively impact this species.

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# Table of contents

<b>Abstract</b> .....	<b>3</b>
<b>Acknowledgements</b> .....	<b>5</b>
<b>Table of contents</b> .....	<b>8</b>
<b>List of tables</b> .....	<b>11</b>
<b>List of figures</b> .....	<b>12</b>
<b>Chapter 1: General Introduction</b> .....	<b>15</b>
1.1 Habitat use of elasmobranchs .....	15
1.2 Tagging and tracking methodologies .....	18
1.3 <i>Pristis microdon</i> and <i>Glyphis garricki</i> .....	21
1.4 Status and threats to <i>Pristis microdon</i> and <i>Glyphis garricki</i> .....	24
1.5 Aims of the study .....	26
<b>Chapter 2: Environments of the Fitzroy River and King Sound, Western Australia</b> .....	<b>29</b>
2.1 Introduction .....	29
2.2 Materials and methods .....	34
2.2.1 Study sites .....	34
2.2.2 Depth .....	39
2.2.3 Temperature .....	39
2.2.4 Salinity .....	40
2.2.5 Turbidity and light attenuation .....	41
2.2.6 Dissolved oxygen and pH .....	41
2.2.7 Tidal cycle .....	42
2.2.8 Data analysis .....	43
2.3 Results .....	44
2.3.1 Depth .....	44
2.3.2 Temperature .....	47
2.3.3 Salinity .....	54
2.3.4 Turbidity and light attenuation .....	57
2.3.5 Dissolved oxygen and pH .....	59
2.3.6 Tidal cycle .....	60
2.4 Discussion .....	60
2.4.1 Temperature .....	61
2.4.2 Salinity .....	63
2.4.3 Turbidity and light attenuation .....	64
2.4.4 Dissolved oxygen and pH .....	66
2.4.5 Conclusion .....	67
<b>Chapter 3: Population demography and life history of <i>Pristis microdon</i> and <i>Glyphis garricki</i> in the Fitzroy River and King Sound, Western Australia</b> .....	<b>70</b>
3.1 Introduction .....	70
3.2 Material and methods .....	72
3.2.1 Study site .....	72



3.2.2	Sampling	74
3.2.3	Data analysis	76
3.3.	Results	80
3.3.1	<i>Pristis microdon</i>	80
3.3.1.1	Catch composition and distribution	80
3.3.1.2	Catch per unit effort	85
3.3.1.3	Growth	87
3.3.1.4	Mortality and survivorship	90
3.3.2	<i>Glyphis garricki</i>	91
3.4	Discussion	94
3.4.1	Distribution	95
3.4.2	Population composition	97
3.4.3	Population life history	100
3.4.3.1	Growth	100
3.4.3.2	Mortality	101
3.4.4	Catch per unit effort	102
3.4.5	Conclusion	105

#### **Chapter 4: Depth use and inter-pool movement of juvenile**

##### ***Pristis microdon* in the Fitzroy River** . . . . . **107**

4.1	Introduction	107
4.2	Materials and methods	108
4.2.1	Study site	108
4.2.2	Acoustic array and range testing	110
4.2.3	Tagging	113
4.2.4	Environmental conditions and prey abundance	115
4.2.5	Data analysis	116
4.3	Results	117
4.3.1	Acoustic array and range testing	117
4.3.2	Acoustic tag performance	118
4.3.3	Depth use	121
4.3.4	Inter-pool movement	126
4.3.5	Relative abundance of <i>Pristis microdon</i> prey	127
4.4	Discussion	128
4.4.1	Depth use	129
4.4.2	Inter-pool movement	131
4.4.3	Acoustic tag performance and utility	134
4.4.4	Conclusion	136

#### **Chapter 5: Utility of conventional and satellite tags in the monitoring of large-scale movement and habitat use patterns of**

##### ***Pristis microdon* and *Glyphis garricki*** . . . . . **138**

5.1	Introduction	138
5.2	Materials and methods	140
5.2.1	Study site	140
5.2.2	Tagging	142
5.2.3	Data analysis	146
5.3	Results	147
5.3.1	Rototags	147

5.3.2 Satellite tags .....	150
5.4 Discussion .....	152
5.4.1 Rototags .....	153
5.4.1.1 Utility .....	153
5.4.1.2 Habitat use .....	155
5.4.2 Satellite tags .....	157
5.4.2.1 Utility .....	157
5.4.2.2 Habitat use .....	158
5.4.3 Conclusion .....	159
<b>Chapter 6: General discussion .....</b>	<b>161</b>
6.1 <i>Pristis microdon</i> habitat use .....	161
6.2 <i>Glyphis garricki</i> habitat use .....	163
6.3 Potential impacts of habitat alterations on the habitat use of <i>Pristis microdon</i> and <i>Glyphis garricki</i> .....	164
6.4 Future research .....	167
<b>References .....</b>	<b>170</b>
<b>Appendix I: <i>Pristis microdon</i> catch data (2005 to 2009) .....</b>	<b>194</b>

## List of tables

Table 2.1.	Minimum and maximum temperatures of monitored pools in 2007 to 2009 . . . . .	48
Table 2.2.	Correlation coefficients ( $p < 0.05$ , score not given if $p > 0.05$ ) of river water and air temperatures, as well as river discharge of monitored pools at varying temporal and spatial scales . . . . .	52
Table 2.3.	Seasonally separated correlation coefficients ( $p < 0.05$ , score not given if $p > 0.05$ ) of river water and air temperature, river discharge and tidal height at varying spatial scales employing daily and weekly means . . . . .	53
Table 3.1.	Percentage of yearly 20-m net sets for each respective gillnet mesh size deployed . . . . .	75
Table 3.2.	Methods used for calculating natural mortality ( $M$ ) estimates . . . . .	80
Table 3.3.	Number of captured male/female <i>Pristis microdon</i> for respective years and size classes in the Fitzroy River . . . . .	84
Table 3.4.	Total CPUE ( <i>Pristis microdon</i> 100 h <sup>-1</sup> of 20-m net set) for YOY and >0+ juvenile <i>Pristis microdon</i> for the 2002 to 2009 early and late dry seasons, in the Fitzroy River . . . . .	86
Table 3.5.	Growth data of <i>Pristis microdon</i> at liberty for >1 month in the Fitzroy River . . . . .	88
Table 3.6.	Scores and von Bertalanffy growth function parameters produced from ELEFAN and PROJMAT methods using non-seasonal and seasonal growth curves . . . . .	89
Table 3.7.	Natural mortality ( $M$ ) and annual survivorship ( $S$ ) of juvenile <i>Pristis microdon</i> . . . . .	91
Table 3.8.	<i>Glyphis garricki</i> captures in 2007 and 2008 in King Sound . . . . .	93
Table 3.9.	Number of elasmobranchs, by species, captured within the upper King Sound (excludes the NW King Sound area) . . . . .	94
Table 4.1.	Acoustic tag deployment information for 2007 to 2009 . . . . .	114
Table 4.2.	Detection details of acoustic tags deployed in 2007 to 2009 . . . . .	119
Table 5.1.	Satellite tag deployment information . . . . .	145
Table 5.2.	<i>Pristis microdon</i> recaptures in the Fitzroy River in 2005 to 2010 . .	149

## List of figures

- Fig. 2.1. (a) Map of sampled sites in the Fitzroy River (2007 to 2009), and satellite photos of (b) estuarine and (c) freshwater pools in the dry season at similar magnification . . . . . 36
- Fig. 2.2. Sampled sites (red dots) and areas (shaded) within the King Sound (2007 to 2009). Green shading = NW King Sound area, orange shading = SW King Sound area, yellow shading = SE King Sound area, red shading = Point Torment area, blue shading = Stokes Bay area . . . . . 37
- Fig. 2.3. Maximum daily stage height (m) at Camballin Barrage station, Fitzroy River for the 2002 to 2009 wet seasons; data courtesy of the Department of Water, Government of Western Australia . . . 45
- Fig. 2.4. Maximum daily discharge ( $\text{m}^3 \text{s}^{-1}$ ) at Willare station, Fitzroy River for the 2002 to 2009 wet seasons; data courtesy of the Department of Water Government of Western Australia . . . 45
- Fig. 2.5. Total annual (December to November) river discharge (ML) at Willare station, Fitzroy River for 2002 to 2009; data courtesy of the Department of Water, Government of Western Australia . . . 46
- Fig. 2.6. Depth profiles of (a) estuarine and (b) freshwater pools. Depth profiles extend to the maximum detection range up (+) and downstream (-) of moored acoustic receivers (see Chapter 4) . . . . . 47
- Fig. 2.7. Recorded air, King Sound and Fitzroy River (Milli Milli = estuarine representative, Myroodah Crossing = freshwater representative) temperatures between June 2007 and October 2009; air temperature data was courtesy of the Bureau of Meteorology, Commonwealth of Australia (2010) . . . . . 49
- Fig. 2.8. Monthly mean ( $\pm$  s.e) diel temperature ranges of monitored Fitzroy River pools . . . . . 50
- Fig. 2.9. Tide and water temperature ( $^{\circ}\text{C}$ ) profiles in Milli Milli in the late dry season 2008 . . . . . 51
- Fig. 2.10. Mean (+ s.e.) salinity of monitored sites in nearshore waters of the Fitzroy River and King Sound in (a) June/July and (b) September to November . . . . . 56
- Fig. 2.11. Light intensity (lux) in Telegraph Pool (0.5 m) and Myroodah Crossing (1.5 m) at the start of the 2009 wet season . . . . . 58

Fig. 2.12.	Logged light intensity (lux) in Myroodah Crossing (at a depth of 1.5 m) during the 2009 wet season, in relation to the stage height recorded at the Camballin Barrage (~38 km upstream of Myroodah Crossing) . . . . .	58
Fig. 3.1.	Sampled sites (red dots) and study areas (shaded) in King Sound and Fitzroy River between 2005 and 2009. Green shading = NW King Sound area, orange shading = SW King Sound area, yellow shading = SE King Sound area, red shading = Point Torment area, blue shading = Stokes Bay area . . . . .	73
Fig. 3.2.	<i>Pristis microdon</i> capture locations in 2005 to 2009 (red dot), and in 2002 to 2004 (Thorburn <i>et al.</i> 2007) (blue square) . . . . .	82
Fig. 3.3.	<i>Pristis microdon</i> total length-frequency histograms for 2002 to 2009 . . . . .	83
Fig. 3.4.	Total <i>Pristis microdon</i> CPUE (circle) and percentage of positive <i>Pristis microdon</i> gillnet captures (square) in the early (June to July; black symbol) and late (October to November; gray symbol) dry season (2002 to 2009); only freshwater pools were sampled in 2005 as well as late 2004 and late 2009 . . . . .	87
Fig. 3.5.	Best fit growth curves produced by non-seasonal (a) ELEFAN and (b) PROJMAT methods for juvenile <i>Pristis microdon</i> plotted on original length-frequency data . . . . .	88
Fig. 3.6.	Age-dependent indirect natural mortality estimates of juvenile <i>Pristis microdon</i> calculated using Peterson and Wroblewski (1984), Chen and Watanabe (1989) and Lorenzen (1996) methods . . . . .	91
Fig. 3.7.	<i>Glyphis garricki</i> capture locations in King Sound in 2007 and 2008 (red dot), and in 2002 to 2004 (blue square) (Thorburn and Morgan 2004) . . . . .	92
Fig. 4.1.	Acoustic monitoring stations (red dots) in the Fitzroy River, Western Australia. Crs. = Crossing, Lwr = Lower, Pl. = Pool, Up = Upper . . . . .	110
Fig. 4.2.	Activity of (top) acoustic tags and (bottom) hydrophones in the respective pools. Tag deployments are represented by triangles and detected transmissions are represented by circles. 1: Milli Milli, 2: Snag Pool, 3: Telegraph Pool, 4: Langi Crossing, 5: Myroodah Crossing 1, 6: Myroodah Crossing 2, 7: Camballin Pool, 8: Lower Barrage Pool, 9: Upper Barrage Pool . . . . .	120

Fig. 4.3.	Depth profiles of <i>Pristis microdon</i> (a) <1000 mm, (b) 1400 to 1650 mm and (c) >1850 mm TL in the dry season. Only tags with >30 hits per hour for every hour are displayed. Note that the scales of the x and y-axes vary between graphs . . . . .	123
Fig. 4.4.	Recorded depths of <i>Pristis microdon</i> tag (a) 17 (Camballin Pool), (b) 18 (estuarine pools), (c) 19 (estuarine pools), (d) 9 (estuarine pools) and (e) 16 (Myroodah Crossing), in comparison to river stage height in the 2009 wet season. No other tags were detected during the wet season . . . . .	124
Fig. 4.5.	Mean hourly depths ( $\pm$ s.e.) of (a) <1000 mm TL, (b) 1400 to 1650 mm TL and (c) >1800 mm TL <i>Pristis microdon</i> in the Fitzroy River . . . . .	125
Fig. 5.1.	Survey sites in the Fitzroy River and King Sound, Western Australia . . . . .	142
Fig. 5.2.	(a) Rototag and (b) SPOT-5 satellite tag attachment sites and methods . . . . .	146
Fig. 5.3.	Initial capture (diamond) and recapture (circle) sites of conventionally tagged <i>Pristis microdon</i> observed to move between pools in the Fitzroy River. . . . .	150
Fig. 5.4.	Deployment (diamond) and calculated transmission locations (circles) for tagged <i>Pristis microdon</i> and <i>Glyphis garricki</i> in King Sound . . . . .	152