



Student Progress Reporting Form WAMSI Top-up Scholarship

STUDENT:	Sarah Fretzer	DATE:	NOVEMBER 2008
SUPERVISOR:	Norman Hall and Hector Lozano-Montes		

PROJECT TITLE:	Ecosystem Modelling
NODE LEADER:	Rick Fletcher
PROJECT NUMBER:	4.3.2

REPORTING REQUIREMENTS	
1	<p>PROGRESS REPORT FROM SUPERVISOR</p>
	<p>Overall aims of research</p> <p>The principle objective of Sarah Fretzer's PhD study is to develop quantitative models of the aquatic ecosystem of the Peel-Harvey Estuary for the periods both before and after the opening of the Dawesville Channel, and to use these models to explore how the system is likely to respond to further pressures such as increased urban development or increased fishing.</p>
	<p>Progress made on the project</p> <p>Sarah Fretzer has made good progress on the quantitative modelling study, and has developed Ecopath, Ecosim and Ecospace models of the Peel-Harvey Estuary for the two time periods. Draft chapters describing these models have been prepared by Sarah for her thesis and are currently being reviewed by her supervisors. It is anticipated that the thesis will be submitted in early 2010, following which Sarah intends to prepare papers describing her modelling work such that these may be submitted to appropriate journals</p>
	<p>Any major risk issues [that the WAMSI CEO should be made aware of]</p> <p>Ecosim models are typically tuned by running simulations using observed catches to drive the model and adjusting parameters to provide a good match of model predictions to catch per unit of effort data. The quality of the fishery data that are available for the Peel-Harvey Estuary for such tuning are poor, as recreational catches are a major component of the total catch and, as is typical for recreational fishery data, no time series of such catches are available. Hence, a reliable time series of total catch data that can be used to drive the model is not available. Although the model can be "tuned" to the available data, it is likely that we will be obliged to accept considerable uncertainty in the results. The problem is exacerbated by the fact that the catch-per-unit-of-effort data from the commercial fleet are derived from a multispecies fishery, in which effort is directed towards species in response to availability and market pressure, thus masking the signal relating to variation in biomass. Thus, although Sarah will have tuned the models to the extent possible, it will need to be recognised that the resulting model predictions are likely to reflect the quality of the input data that are available,</p>

REPORTING REQUIREMENTS	
2	PROGRESS REPORT FROM STUDENT
	<p>Summary of progress</p> <p>The PhD project is close to completion. The first draft of the thesis has been developed and is currently being revised by supervisors. At this stage, the thesis is likely to be submitted in early 2010</p> <p>Further investigation is currently being undertaken to resolve problems with model calibration that have emerged. These problems relate to the quality and information content of the fishery data that are available, where lack of recreational catch data affects the reliability of the time series of catches and the multi-species nature of the fishery affects the time series of commercial catch rates.</p>
	<p>Summary of major findings to-date</p> <p>Note that the results below are those derived from preliminary analyses, as the models have yet to be finalised.</p> <p>The Dawesville Channel appears to have had substantial impact on the ecosystem of the Peel-Harvey Estuary. Since the opening of the Dawesville Channel, the ecosystem has declined in size (i.e. total energy flow through the system) by almost 99%. All four trophic levels in the estuary have decreased in biomass since the opening of the artificial entrance channel in 1994, particularly the biomass of primary producers which has decreased massively.</p> <p>The analysis suggests that the estuarine ecosystem is under considerable fishing pressure and indicates that it might be impacted further in the future if increased urbanisation leads to further habitat destruction.</p>
	<p>Presentations made at workshops & conferences</p> <p>Presentations of research progress were made at WAMSI Symposia in 2008 and 2009</p> <p>Indo- Pacific Fish Conference in Fremantle 2009, oral presentation: "The impact of an artificial entrance channel and the impact of fishing on the ecosystem of the Peel-Harvey Estuary, Western Australia"</p>
	<p>Final report</p> <p>Not yet available</p>
3	OTHER REQUIREMENTS
	<p>Major findings to be reported immediately</p> <p>Until models are finalised, it is premature to report the findings as these may be subject to modification.</p>
	<p>Supervisor & student present at a minimum of one WAMSI organised event</p> <p>Presentations of research progress were made at WAMSI Symposia in 2008 and 2009</p>
	<p>Node Leader, supervisor and student to meet at a minimum of 2 times yearly</p> <p>Achieved</p>

REPORTING REQUIREMENTS		
		Final report to be placed on WAMSI website
		Final report is not yet available