



Student Progress Reporting Form WAMSI Top-up Scholarship

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| STUDENT: | Christopher Hallett | DATE: | NOVEMBER 2009 |
| SUPERVISOR: | Fiona Valesini, Ian Potter | | |

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| PROJECT TITLE: | Estuarine Health Index |
| NODE LEADER: | Rick Fletcher |
| PROJECT NUMBER: | 4.2.1(b) |

| REPORTING REQUIREMENTS | |
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| 1 | <p>PROGRESS REPORT FROM SUPERVISOR [TO INCLUDE]</p> <p style="text-align: center;">Overall aims of research [to be used on the WAMSI website]</p> <p>This project aims to develop a reliable, practical and cost-effective index for assessing the health of the Swan Estuary, based on fish assemblage characteristics. The index will incorporate a suite of metrics, each of which measures a different aspect of the fish community, <i>e.g.</i> species diversity and composition, use of the estuary as a nursery habitat and the trophic structure (feeding relationships between species) of the estuarine fish community. Together, these metrics will provide managers and scientists with a reliable but simplified measure for quantifying and monitoring the health of the Swan Estuary.</p> |
| | <p style="text-align: center;">Progress made on the project [to be communicated to the WAMSI Board]</p> <p><i>Progress to date:</i> The current sampling regime replicates and builds upon those employed during previous studies (1977-2004), and involves the collation and analysis of fish community data collected seasonally over a two year period from the Swan Estuary. All sampling, laboratory processing and data entry has now been completed.</p> <p>Fish were collected in the middle month of each season between July 2007 and May 2009 from nearshore and offshore sites (< 2 m and > 2 m deep, respectively) throughout the Swan Estuary. Nearshore sites were sampled using 21.5 m or 41.5 m long seine nets, and offshore sites using composite sunken gill nets. All fish were identified to species and the total number of individuals of each species in each sample was recorded.</p> <p>An extensive suite of fish assemblage metrics have been tested for their suitability</p> |

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| | <p>for incorporation into the estuarine health index. Historical data have been subjected to a variety of statistical analyses in order to select those metrics which most consistently and sensitively highlight changes in the condition of the Swan Estuary over time. Two sets of fish metrics have now been selected, from which to construct indices for assessing the health of nearshore and offshore waters of the Swan Estuary. Current work centres on establishing appropriate reference conditions and scoring thresholds for each of the selected metrics.</p> <p>The numbers of each fish species collected in samples from the previous and current studies are currently undergoing standardisation by expressing them as comparable densities (seine net data) or as catch rates per unit time (gill net data). The specific method employed to do this is being determined using data from a net selectivity study, completed during October-November 2008 and April-May 2009. This investigation employed seine nets of each of the sizes used during the previous studies (21.5, 41.5 and 133 m), in order to evaluate biases inherent among the different sampling methods, and to enable reliable integration of historical and current data.</p> |
| | <p>Any major risk issues [that the WAMSI CEO should be made aware of]</p> <p>N/A</p> |
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| 2 | <p>PROGRESS REPORT FROM STUDENT TO [INCLUDE]</p> <p>Summary of progress [to be used on the WAMSI website]</p> <p>The project, funded by the Department of Fisheries, Department of Water, Swan River Trust and Murdoch University, involves the collation and analysis of fish community data collected seasonally over a two year period (2007-2009) from the Swan Estuary. Fish were collected from over 20 nearshore and offshore sites throughout the Swan Estuary. Nearshore sites were sampled using seine nets, and offshore sites using sunken gill nets. All fish captured were identified to species and the total number of individuals of each species in each sample was recorded. All field sampling, laboratory processing and data collation has now been completed.</p> <p>A large range of fish community metrics have been tested for their suitability for incorporation into the estuarine health index. A variety of graphical and statistical methods were employed to select appropriate fish metrics, including the use of historical fish community data to identify those metrics sensitive to changes in the condition of the Swan Estuary over time. Two sets of fish metrics have now been selected, from which to construct indices for assessing the health of both nearshore and offshore waters of the Swan Estuary.</p> <p>Current work centres on using fish community data collected between 1977 and 2009 to establish appropriate reference conditions and scoring thresholds for each of the selected metrics, against which the current and future health of the estuary may</p> |

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| | <p>be assessed.</p> <p>The index developed in this study will allow managers to quantify the health of the Swan Estuary, establish a regime for tracking estuarine health in the future, and facilitate informed and effective management of the Swan Estuary.</p> |
| | <p>Summary of major findings to-date [to be used on the WAMSI website]</p> <p>N/A</p> |
| | <p>Presentations made at workshops & conferences</p> <p>Presentations related to the project have been delivered at the following:</p> <ul style="list-style-type: none"> • National Estuaries Network Open Public Forum: Estuary Science for a Changing Climate, UWA, May 2007 • AMSA WA 5th Annual Student Workshop, Rottnest Island, July 2007 • The Centre for Ecosystem Management Seminar Series, ECU, August 2007 • AMSA WA 6th Annual Student Workshop, Rottnest Island, July 2008 • AMSA WA 7th Annual Student Workshop, Rottnest Island, July 2009 • Swan River Trust Research Program Showcase, Perth, 2009 • Coastal and Estuarine Research Federation Conference, Portland, Oregon, USA, November 2009 <ul style="list-style-type: none"> • In addition, I have presented seminars on the progress of the project at five 6-monthly meetings with stakeholders and funding bodies. |
| | <p>Final report [approximately 10 pages if the project has concluded]</p> <p>N/A</p> |
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| 3 | OTHER REQUIREMENTS |
| | <p>Major findings to be reported immediately [to be used for media, website, increased funding opportunity]</p> <p>Major findings will follow upon completion of the project.</p> |
| | <p>Supervisor & student present at a minimum of one WAMSI organised event</p> <p>Co-supervisor Steeg Hoeksema outlined the progress of the project, and its implications for the management of the Swan Estuary, at the recent WAMSI Node 4 Research Symposium, Hillarys, November 2009. At this time, the student was presenting the project at the Coastal and Estuarine Research Federation Conference in Portland, Oregon, USA.</p> |
| | <p>Node Leader, supervisor and student to meet at a minimum of 2 times yearly [preferably more]</p> |

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| | <p>Supervisor and student meet on a weekly basis.</p> <p>No meetings with the Node Leader have taken place thus far. The student has had numerous meetings with Euan Harvey on the progress of the project.</p> |
| | <p>Final report to be placed on WAMSI website</p> <p>Final report will be delivered upon completion of the project (due date December 2010)</p> |