



FINAL WAMSI PROJECT REPORT

Instructions for Use: Please complete each of the sections below and return to (insert Node Science Coordinator's name/Node Leader's name and email contact details in order to enable scientific verification of the report prior to it passed on to the WAMSI HQ). The project report template tries to cover all the major facets of reporting that are required. There is some flexibility in how this proforma is completed, based mainly on the size of the project and whether there are a number of discrete sub projects. For example, if the project is quite small and has a single, simple methodology, then complete sections 3, 4, 5, etc. If the project has multiple discrete sub projects, then complete section 2 as this enables discrete research chapters to be written. Discussion, acknowledgements and references can be combined if the project sub components being reported on are related and cross reference one another. In the situation where the sub project components are very different, then the discussion, acknowledgements and references will need to be kept as discrete entities as they relate to that particular sub project. If there is any clarification required, please don't hesitate to contact the WAMSI HQ staff.

Project Details

Project Number and Title:	Node 5 Project 1 Western Australia Marine Bioresources Library (WAMBL)
Node Leader:	Howard Shawcross
Project Leader:	Jane Fromont & Libby Evans-Illidge
Project Team:	As above & Oliver Gomez
Project Start Date:	1 st August 2008 (approved delayed start to 1 st November 2008)
Project End Date:	30 th July 2011
Due Date for Final Report:	
Project Team:	
Project Funding:	
WAMSI	\$
Additional Cash	\$
Additional In-Kind	\$
Total Funding	\$

1. Project Objectives and Achievement Criteria

Confirmation of the project objectives and the delivery of milestones against the Key Performance Indicators:

Original project objectives:

- 1** Establish a marine bioresources library to facilitate sustainable access to characterised Western Australian marine biodiversity for biodiscovery. **Library of specimens established, Milestones 3 & 4.**
- 2** Establish standard operating procedures to access samples in the library in compliance with all access and benefit sharing provisions required by WA State government agencies, and WA Museum data capture requirements. **Operating procedures established, Milestone 2.**
- 3** Maximise the capture of knowledge regarding Western Australian marine biodiversity that is made available for biodiscovery, and consolidate it at the Western Australian Museum in a format that is accessible to the State's natural resource managers. **Specimens with acceptable provenance in WAMBL, Milestones 3 & 4.**
- 4** Identify ways that the Western Australia Marine Bioresources Library could be maintained and expanded after the completion of WAMSI. **Draft business plan, revised Milestone 6, still to be completed.**

2. Research Chapter(s)

This section should make up the bulk of the report and may include more than one chapter where there

are a number of sub-projects that are contained within one project. The section should include the following subheadings for each project/sub-project.

- a) Introduction
- b) Methodology - further details provided below in (3)
- c) Results - further details provided below in (4)
- d) Discussion - further details provided below in (5)
- e) Acknowledgements
- f) References

3. Methodology

Summarise the method(s) utilised as part of the project and provide a listing of the sub-projects (if appropriate). Sub-project reports should be provided as annexures to this project report.

Library Inventory: this project established a table linked to the Western Australian Museum marine invertebrates collections database. Consequently data is backed up every 24 hours. The table fields were modelled on the AIMS Bioresources Library database and include amount of frozen material and how and where it is stored, as well as tracking material that has been sent for research (list of fields below). The collections database contains all details on provenance of the specimens, including all collecting data including georeferencing of locations and depths (list of fields below).

Table 1. Fields in the WAMBL and MIZ (marine invertebrate zoology) databases.

WAMBL database fields	MIZ database fields
Registration (Z) Number	Registration (Z) Number
Number of Samples (from 1 to 10)	Old Catalogue (or Field Number)
Sample Size (100g or 2g)	Phylum
Storage	Class
Storage Location (Box Number)	Order
Sample Weight	Family
Loan	Genus
Total Sample Weight (calculating button)	Subgenus
	Species
	Authority
	Determiner (Identifier)
	Year Determined
	Reliability of Determiner
	Habitat
	Country
	Locality
	Latitude
	Longitude
	Collector(s)
	Expedition
	Station
	Collecting Method
	Date Collected
	Source Obtained (Donated, Collected, etc.)
	Specimen Number
	Specimen Type (Holotype, Voucher, etc.)
	Storage (Wet or Dry)
	Fixed (10% Formalin, 100% EtOH, 75% EtOH)
	Preserved (10% Formalin, 100% EtOH, etc.)
	Remarks (any additional data)

Guidelines for access to WAMBL: these guidelines provide advice on how to fill out a Fisheries reg 179

permit to access samples from WAMBL. They explain reporting requirements and what to do with material remaining post project. They also contain the Material Transfer Agreement between WAMBL and the recipient of the samples which must be signed before samples are released from WAMBL, and all terms and conditions associated with the agreement.

Attachment 1: WAMBL MTA

Permissions: The WA Museum and other WA institutions hold frozen samples collected for biodiversity purposes, but of suitable provenance for WAMBL. We established a standard letter requesting formal lodgement of these samples into WAMBL. Permissions were achieved for collections of both Commonwealth and State samples, which are now held in WAMBL.

Attachment 2: Standardised permissions letter.

Storage: There are three 700 litre freezers holding bulk sample in WAMBL. 2g aliquots are held in a -80°C upright freezer in small storage boxes, and 10g aliquots for rapid replacement of 2g aliquots are held in a dedicated chest freezer. All freezers are on the Museum back up electrical system (generators) so power cannot fail to these collections. Provenance is excellent.

4. Results

Present the results of the project and attainment of scientific objectives. Assess the success of meeting each objective identified in the proposal, as initially approved or later modified. For each objective:

1. Re-state the objective,
2. Tell the degree to which it has been met, and
3. Describe the technical findings and conclusion in a paragraph or two. This language should be informative, not just indicative (i.e., don't say "a new process was developed," but rather "the XYZ method increases productivity by 20 %"). A sample statement might begin, "Objective 1 -- To increase survival of juvenile...by 50%. This objective has been met. Survival of.....was increased 67% by altering culture tanks in the following way. If an objective was not 100% complete at the end of a project, indicate why.

Objective 1: Establish a marine bioresources library to facilitate sustainable access to characterised Western Australian marine biodiversity for biodiscovery.

A library of sponge specimens has been established in the WA Museum with 157 frozen Commonwealth collected samples and 50 State collected samples incorporated into WAMBL. 466 frozen samples with extracts, collected from Western Australian waters are virtually incorporated into WAMBL i.e they are held at AIMS in Townsville but have been 'signed over' to WAMBL which is now their only release point for biodiscovery research. The WAMSI project did not identify funds for the AIMS material to be physically incorporated into WAMBL. This aspect is being costed in the business plan currently being drafted that will also identify the costs associated with continuing to operate WAMBL.

Objective 2: Establish standard operating procedures to access samples in the library in compliance with all access and benefit sharing provisions required by WA State government agencies, and WA Museum data capture requirements.

Operating procedures to access material for biodiscovery purposes from WAMBL were established in December 2009. These procedures and the Material Transfer Agreement have been used on the two occasions extracts and samples were released for biodiscovery, in October 2010 to WAIMR and in December 2010 to the Pharmacology Unit, School of Medicine & Pharmacology, UWA. Further, these operational procedures and MTA were drafted such that they can continue to be used when Biodiscovery Legislation is introduced in Western Australia.

Objective 3: Maximise the capture of knowledge regarding Western Australian marine biodiversity that is made available for biodiscovery, and consolidate it at the Western Australian Museum in a format that is accessible to the State's natural resource managers.

Only specimens with acceptable provenance were incorporated into WAMBL. Acceptable provenance includes detailed collecting data as outlined in Table 1 above, as well as ensuring samples incorporated into WAMBL have met acceptable storage conditions since their collection i.e. have been continuously frozen. A WAMBL database was established as a table linked to the Western Australian Museum marine invertebrates collections database. Data is backed up every 24 hours. The table fields were modelled on the AIMS Bioresources Library database and include amount of frozen material and how and where it is stored, as well as tracking material that has

been sent for biodiscovery research (see Table 1). The collections database contains all details on provenance of the specimens, including all collecting data including georeferencing of locations and depths. Project metadata is available via IVEC, and the WAMBL sample data will be available via the WA Museum website once the project is completed (2011).

Objective 4: Identify ways that the Western Australia Marine Bioresources Library could be maintained and expanded after the completion of WAMSI.

This objective was to be developed pending success in obtaining additional resources to operate WAMBL. Unfortunately additional resources have not been forthcoming. However, it was decided in discussion with the WAMSI Board Chairman, Dr Peter Rogers, and the current Node Leader, Mr Howard Shawcross, that this would be a useful document, and it is currently being developed with the aim of producing a draft in August, prior to the WAMSI conference in September.

5. Discussion

Implications for Management and Advancement of the Field – Describe the key findings as they relate to the objectives and the management questions discussed at the outset of the project.

Operating procedures to access material for biodiscovery purposes from WAMBL have been established. These procedures and the Material Transfer Agreement were drafted such that they can continue to be used when Biodiscovery Legislation is introduced in Western Australia.

The Western Australian Museum marine invertebrates collections database contains all details on provenance of the specimens in WAMBL, including species identification, and all collecting data including georeferencing of locations and depths.

Problems encountered (if any) – Describe any major problems/issues encountered during the study and how they were addressed.

The major problems encountered in this project were directly related to the lack of biodiscovery legislation in Western Australia. For this reason the release of samples from WAMBL was significantly delayed while a way to enable this to occur was determined by the then Node Leader Mr Jason Froud. For example, the milestone related to the release of samples for biodiscovery research to WAIMR was delayed for over one year, from July 2009 to October 2010, reflecting this significant difficulty. The solution was an agreement between Fisheries, WA and UWA which allowed for samples to be released to research institutions associated with UWA. It is uncertain if a similar agreement would have to be negotiated between Fisheries and a research institution if the latter was not associated with UWA. Currently non UWA affiliates have shown interest in accessing WAMBL samples, the latest being a researcher at the Chem Centre, Curtin University in April 2011, but have not currently finalised the Fisheries reg 179, which is the permit required to handle WAMBL samples. Subsequent release of samples to UWA affiliates has been straightforward.

The legal uncertainty associated with benefit sharing has resulted in companies not pursuing access to samples from WAMBL. WAMBL was contacted on a number of occasions about access to samples but without clear benefit sharing legislation none of these companies was prepared to proceed. The impediment was that if they discovered a compound of interest they had no understanding of their rights in relation to the compound. The latest contact was by BHP Corporate Ltd in March 2011.

Another issue that remains unresolved due to lack of WA legislation is the use of already collected frozen samples. WAMBL has negotiated prior informed consent with researchers who have collected frozen specimens from WA State waters under biodiversity permits obtained from Fisheries WA or from DEC. Frozen sample that is more than required for WA Museum taxonomic vouchers are held at the Museum and have been incorporated into WAMBL. However, these samples have not been released for biodiscovery research due to the uncertainty about whether the permit agencies, DEC and Fisheries WA would consider this appropriate use of such samples. Indications from these agencies, particularly DEC, are that they would not consider this appropriate, which means the Museum may be required to permanently dispose of these samples. The WAMBL position is that these biodiscovery collected specimens are excess to taxonomic need but since they have been collected (killed) their usage should be maximised, reflecting the concept of sustainable use of State marine resources. This is particularly the case where it is unlikely that the species will not be collected from those locations again; eg. the frozen samples associated with the deeper waters off Ningaloo (WAMSI Node 3), or more recently collected in the Kimberley, and held at the WA Museum. The Northern Territory legislation approves of previously

collected samples being available for biodiscovery and it is important the WA legislation addresses this issue in a similar manner. This is the least wasteful outcome of such excess collections.

New Research Directions (if any) – Identify new research directions pursued during the course of the project and reasons for modifying original research plans. Describe how the changed research agenda improved the project.

N/A

6. Overall Project Accomplishments

Students supported – Record the name of each student involved with the project. Indicate whether PhD or other (give details) and briefly describe their role.

N/A

PhD theses, Dissertations and Student Placement – Please give complete citation for theses and dissertations (student's name, month and year completed or expected, level of degree, institution). Please provide a copy of the abstract of the thesis or dissertation when complete.

N/A

Publications - List in standard academic format the citations of literature produced during the reporting period. Include journal articles, book chapters, reports, etc. submitted, in press and printed. Please provide a paper and electronic version copy of each publication resulting from the project. If there is a link to the journal electronically, please also include this.

Publication in prep.

Large scale patterns in Australian marine bioactivity

Elizabeth Evans-Illidge, David Abdo, Jason Doyle, Jane Fromont, Lyndon Llewellyn, Gavin Ericson, Christopher Battershill, and Stuart Kininmonth.

Presentations - Cite any presentations resulting from the project, including conferences, symposiums, etc.

9 February 2010. *Show and Tell 2010, WAMSI Node 5 overview*. WAMSI Show and Tell symposium, Western Australian Museum – Fremantle, presented by J. Fromont.

Other Communications Achievements - Interviews, press releases, etc.

West Australian newspaper article 27th February 2009
ABC 720 Perth 17:30 news 4th March 2009
Channel 10 TV 17:30 Perth news 4th March 2009
ABC1 TV 19:00 Perth news 4th March 2009
ABC 720 Perth 22:00 news 4th March 2009
The West Australian Friday 6th March 2009 p.14 'Specimen jars hold key to future cures'
ABC Goldfields Esperance radio 8th March 2009 live interview with Nellie Siemer, morning show presenter.
Newsletter of WAIMR Autumn Edition 2011 article on handover of extracts from WAMBL to WAIMR.

7. Overall Project Benefits Please note: Benefits go beyond Results and Accomplishments to provide information on direct physical, environmental, economic or social gains realised as a result of a research project or outreach activity.

Discovery and Application of New Products and Processes (if applicable) - Describe any actual or anticipated products or processes discovered or developed in the project.

<p>No new products. New processes: Delivery of a Material Transfer Agreement that can be used as a model or template for transfer of specimens or extracts for biodiscovery research.</p>
<p>Tools, Technologies and Information for Improved Ecosystem Management - Describe how project results are being (or will be) translated into sustainable use and management of coastal and ocean ecosystems. Tools might include benthic habitat maps or environmental sensitivity indicators. Technologies might include remote and bio-sensing, genetic markers, and culture systems. Information might include technical assistance, training and educational materials.</p>
<p>Environmental: The Western Australian Museum marine invertebrates collections database contains all details on provenance of the specimens in WAMBL, including species identification, and all collecting data including georeferencing of locations and depths. Therefore this database provides information on where the species occur.</p> <p>Technical: The project has delivered a Material Transfer Agreement that can be used as a model or template for transfer of specimens or extracts for biodiscovery research and a standardised prior informed consent letter to signover specimens for biodiscovery research as per international biodiscovery agreements.</p>
<p>Forecasting for Natural Resource Management Decisions - Describe how results already are being used - or are expected to be used after project completion - by natural resource management to make decisions based on project forecasts. Forecasts may be due to field and laboratory studies and models. Examples include hypoxia forecast models, algal bloom alerts, forecasts of fishery harvest, and prediction of impacts from ecosystem stressors such as pollutants or invasive species.</p>
<p>N/A</p>
<p>Impacts - Impacts are higher order, usually long-term results of a project's activities that have significant scientific, economic or social benefits. Impacts may involve behavioural, policy or economic changes. Describe impacts (anticipated or realized. These impacts may involve behavioural, policy or economic changes. Seminal contributions to science are considered impacts especially if the research findings lead to major progress in a particular field, implementation of new technologies or have a substantive bearing on an economic or societal issue.</p>
<p>N/A</p>

8. Project Metadata and Data Generated

These must be available at an open access repository/data centre/IVEC.

Project metadata is available via IVEC, and the WAMBL sample data will be available via the WA Museum website once the project is completed (2011).

<http://waodn.ivec.org/geonetwork/srv/en/metadata.show?uuid=604915b2-eea9-4802-9a78-904ec101ed28>

9. Linkages to Associated Projects – can be WAMSI and non-WAMSI

Ongoing communication between WAMBL and DEWHA (now SEWPaC) enabled CSIRO samples collected pre-2006 from Commonwealth waters off Western Australia, to be incorporated into WAMBL. The mechanisms for this to occur were established in November 2010. Currently SEWPaC and the WA Museum are working towards an agreement that will be in accordance with the Nagoya Protocol due to be ratified in February 2012. A Commonwealth/WAMBL benefit sharing agreement is expected to be in place by the end of 2011.

10. Other Comments and General Discussion

- Establish a 'WA Biodiscovery Act'

- Seek commitment to maintaining a WA Bioresources Library
- Seek commitment to funding PhD & postdoctoral projects that focus on marine biodiscovery
- Achieve better integration, collaboration and outcomes among relevant scientific disciplines (government & industry partners) to support a marine biodiscovery industry in WA

11. Annexures

- **Sub-project reports presented**
- **Additional attachments**

Attachment 1: WAMBL MTA

Attachment 2: Standardised prior informed consent letter.