ANNUAL BUSINESS PLAN 2010-2011

for

The National Collaborative Research Infrastructure Strategy's Research Capability

known as

5.2 Integrated Biological Systems: 5.2.3 Biological Collections –

The Atlas of Living Australia

April 2010
Update 1 June 2010

Contents

1. Executive Summary

Following the significant increase in available funding, the ALA Business Plan for 2009-2010 was finalised in November 2009. Since that time, additional staff members have been recruited to support the new activities and ALA business analysts have refined the detailed plans for each project component.

The present plan is therefore closely similar to that delivered for 2009-2010, with revised budgets and timelines to reflect analysis and planning since November 2009. The main body of this document presents the activities to be completed using ALA-NCRIS funds in 2010-2011. The attachments present an integrated overview of all activities to be completed using ALA-NCRIS and ALA-SS funds through to the end of the current funding in June 2012.

Activity across all project areas is progressing well. The NCRIS-funded Data Integration component is central to all of this work in that it is the hub for combining content from the Collection Data Management, Australian National Species Lists, Rich Data Stores and Geospatial Data Management components and for presenting this integrated content for use by the Data Dissemination component.

A Release Schedule has been developed to coordinate delivery of content and function from all project components (see ***3.3.2 ALA Release Schedule***). This includes a series of initial, internal releases for evaluation by ALA stakeholders, culminating in a first public release of function as Release 5 in September 2010, with major subsequent additions of function through releases leading to Release 10 in August 2011.

2. Project Contents

2.1 Research Infrastructure

Note: this section describes only ALA components to be developed during 2010-2011 using NCRIS funds. *Attachment 1 – ALA Implementation Plan* includes a description of all components to be developed during this period, including those to be funded from EIF funds.

The ALA delivered the 2009-2010 Business Plan in November 2009 to reflect activities to be carried out using both the original NCRIS funds and the additional EIF funding. These planned activities remain unchanged. This section presents the components to be delivered using NCRIS funds. For detail on other activities see ***Attachment 1 – ALA Implementation Plan.***

2.1.1 Data Integration

This activity will be addressed using NCRIS funds.

Data integration activities represent most the core tasks funded under the original ALA NCRIS funding. The focus is on the development of tools and services to index primary information sources and provide integrated views to enable users to select and access those resources which are most relevant to their concerns.

The following components are under development:

1. Ontologies and Vocabularies – data integration within the ALA and with other projects (e.g. AVH, OZCAM, GBIF, EOL, OBIS) depends on a shared understanding of the structure of biodiversity data and agreement about the data elements which can be shared. The ALA is working with TDWG and international projects to set up tools to engage the community in developing and maintaining the ontologies and vocabularies required for this purpose. These structures will be particularly important to the Biodiversity Information Explorer (BIE) and will provide the models to be used within that tool for organising Australian biodiversity information.

2. Metadata Repository – The core component within the ALA's data integration programme will be the Metadata Repository. It will serve as a catalogue of biodiversity information resources (databases, documents, images, etc.) with provider-supplied metadata describing the origins and nature of each resource, but will be extended to link these resources to the species to which they relate, the geographic regions which they cover and to model the relationships between species, regions, habitats, descriptive characters, etc. (using information from tools such as the ALA Geospatial Data Cache). This will allow the ALA to produce web pages giving overviews of the available information relating to each species, region, habitat, etc. The Metadata Repository will therefore act as the engine providing information links to the proposed Data Dissemination components (especially the Biosecurity Portal).

3. User Authentication and Identity Management – The ALA will require the ability to authenticate users for many different purposes: to allow data providers to manage the metadata for their resources; to allow users to identify themselves to make annotations or provide additional data; for taxonomists to contribute to the Australian national checklists; and so on. Building an integrated concept of the expertise of each individual will also allow the ALA to improve its use of the information supplied by each user. The ALA has already held discussions with the Australian Access Federation (AAF) on the use of its services as the identity management and authentication framework for those users who belong to AAF-enabled organisations.

4. Annotation Services – The ALA has received funding from the NCRIS Platforms for Collaboration capability's NeAT programme to develop annotation services to enhance the quality of data and to enable end users to contribute new information to the network. This work is being

carried out at the University of Queensland School of Information Technology and Electrical Engineering and early versions of some of the tools have been integrated into the GBIF Data Portal software at http://data.ala.org.au/. As the ALA proceeds, these tools will be used in many ways, including capturing user suggestions for corrected values within data records, free-text user comments, user tagging of species with descriptive terms, and so on.

5. Data Quality and Sensitive Data Tools – The ALA contracted a review of concerns around potentially sensitive data within state conservation agencies, natural history collections and biosecurity activities. The goal is to develop best practice recommendations for the handling of occurrence records of conservation or biosecurity concern (e.g. reduction of precision of coordinates for records of species considered endangered in the state where they have been recorded, or diverting records of pest species with implications for Australian trade to the relevant authorities). The ALA will provide easy-to-use services to scan sets of records (e.g. as a spreadsheet) to evaluate any possible issues and report back to the data provider. This will be an important tool to help data providers become comfortable about sharing data and allow the broader community to develop consistent approaches to handling records for sensitive taxa. The tool will also support a wide range of additional data validation and other checks. In this form it will become a major component in the ALA's approach to improving data quality. Records with issues can be reported to the data holders and can automatically be annotated with notes or suggested corrections. End users will also be able to use annotation tools to contribute to data quality. Ultimately all such annotations should be handled through workflows which capture responses from the data providers.

In addition the ALA has established a team to assist data providers to share their data. This assistance will include:

1. IT Infrastructure to support sharing data – The ALA is developing infrastructure to simplify the mobilisation of data. This will enable potential contributors who may not have had the resources or expertise to share their data using simple mechanisms that do not require the installation and configuration of complex software. This will be achieved through the implementation of a landing area to receive file exports of data (uploaded via a web interface, FTP or email) and an ALA data sharing access point (IPT instance).

2. Self-service data registration – To manage the ongoing resource overhead required to integrate new data sets into the ALA, self service capabilities will be developed. The process will be fully automated, with new contributors using an online tool kit to register, map and upload their information into the ALA. The ALA will create an online registration and agreement tool that allows data suppliers to control the upload of data.

3. Data sharing agreement – The ALA is developing a "Data Provider Agreement" that will allow contributors to release data under a license that enables sharing and re-use while acknowledging the owner of the data and allowing them to retain control over the IP. Contributors can also choose to limit some uses of the data e.g. non-commercial.

4. Supporting documentation – The ALA will develop a contributor's information pack and other communications and support materials. This documentation will explain to contributors and end-users the key concepts behind the ALA and data sharing. It will also provide a consistent message to stakeholders supporting the goals and principles of the ALA. Support materials, including manuals and step-by-step guides will be developed to assist contributors and users in sharing data and effectively utilising ALA tools.

2.1.2 Hardware and Networking

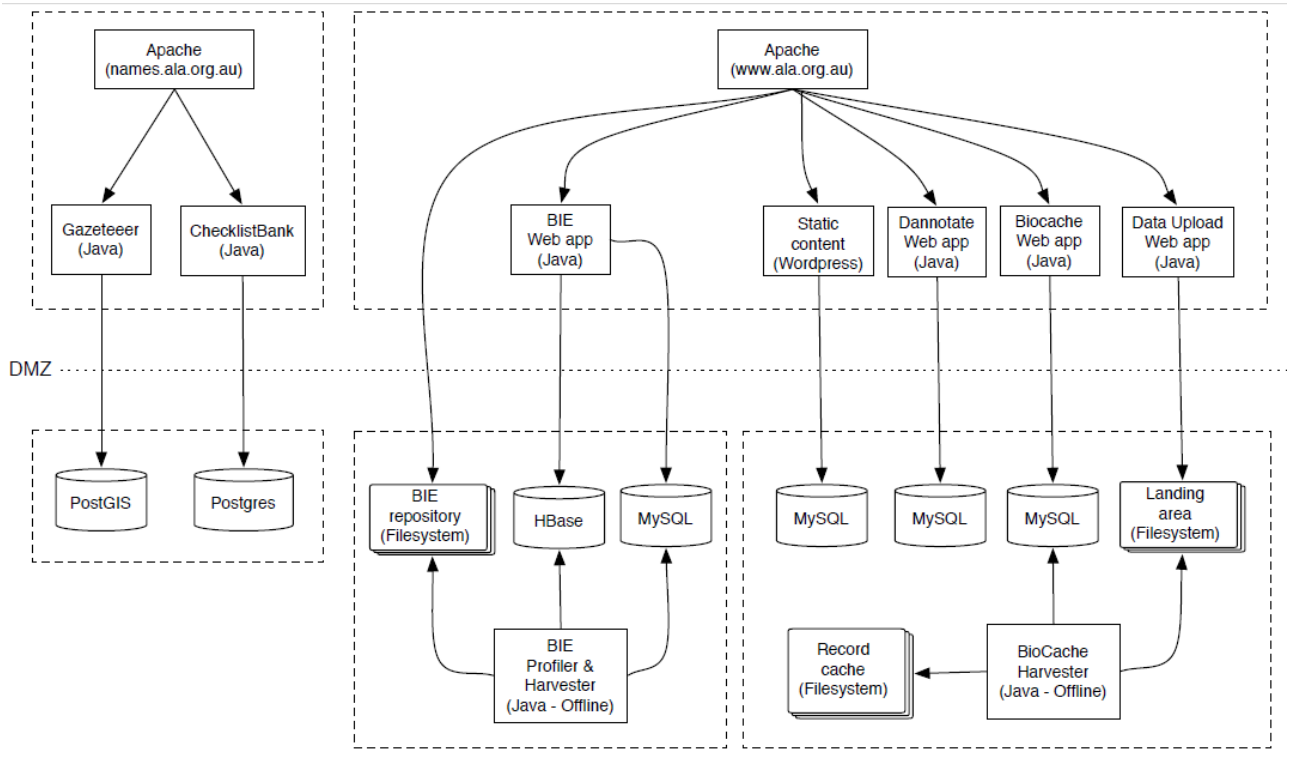
The ALA is currently using the following servers provided by CSIRO IM&T:

Machine	Role	Services	Specification
alaprodweb1-cbr.vm.csiro.au	Production web	Website (www.ala.org.au)	Apache/Tomcat

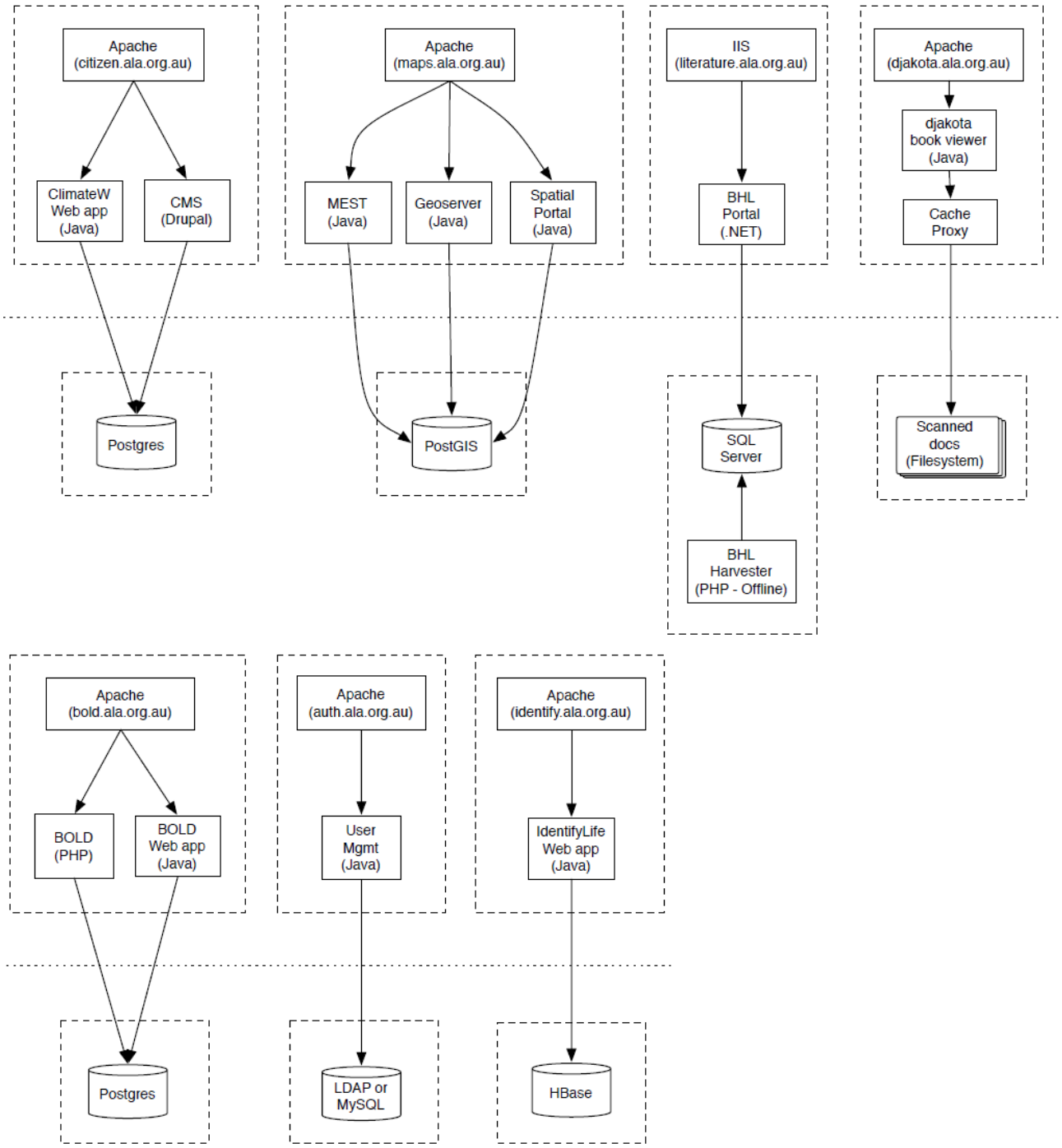
	server	GIS Portal (data.ala.org.au) Mapping Services (maps.ala.org.au) Annotation services (annotate.ala.org.au)	4GB, 2 CPU, 200GB of storage
Alaproddb1-cbr.vm.csiro.au	Production database	Database for production services	MySQL 8GB, 2 CPU, 500GB of storage
alatstweb1-syd.nexus.csiro.au	Test web server	Development versions of GIS Portal and Mapping Services	Apache/Tomcat 4GB, 2 CPU, 200GB of storage
alatstdb1-syd.nexus.csiro.au	Test database	Database for development services	MySQL 4GB, 2 CPU, 500GB of storage
Alaslvweb2-cbr.vm.csiro.au	Indexing web server	Java indexing processes	Apache/Tomcat 4GB, 2 CPU, 200GB of storage
alaslvddb1-cbr.vm.csiro.au	Indexing database	Database for Java indexing processes	MySQL 4GB, 2 CPU, 500GB of storage
diasbdev1-cbr.vm.csiro.au	DIAS-B development server	Web server and database for development of Metadata Repository	Tomcat, MySQL, Fedora Commons 4GB, 2 CPU, 200GB of storage
diasbtest1-cbr.vm.csiro.au	DIAS-B test server	Web server and database for test of Metadata Repository	Tomcat, MySQL, Fedora Commons 4GB, 2 CPU, 200GB of storage
ala01.eresearch.sa.edu.au	Development machine	Spatial portal development machine	4GB, 2CPU, 250GB of storage
ala02.eresearch.sa.edu.au	Development machine	Landing area for new data resources	Apache/SFTP Server 4GB, 2CPU, 250GB of storage
ala03.eresearch.sa.edu.au	Development machine	Checklist bank and name processing tools	POSGRES DB 4GB, 2CPU, 250Gb of storage
ala04.eresearch.sa.edu.au	Development machine	Biodiversity Information Explorer development machine	4GB, 2CPU, 250GB of storage

During 2010-2011, the ALA will work with ARCS to plan and deploy additional storage and servers located around Australia to reflect the locations of activities developing ALA components.

The following diagrams show the planned deployment of applications across servers.



Notes: Dotted lines indicate a VM. Where multiple MySQL and PostgreSQL/PostGIS DBs exist in the same VM, it is expected they will be using the same RDBMS instance/installation. For Java web applications, the platform is expected to be Tomcat version 6. The assumed default VM with be Linux Debian where Windows server is not required.



2.2 Governance

The original ALA Management Committee has been working well and consists of representatives from CSIRO, the peak bodies representing Australian natural history collections, DEWHA and three related NCRIS capabilities (TERN, ABIN, APN), currently under the chairmanship of Frank Howarth (Council of Australian Museum Directors). This committee acts in an advisory role providing high level direction, strategy and guidance to CSIRO and the ALA Director.

CSIRO has responsibility to manage the ALA project and NCRIS funds and ensure that the project is carried out in accordance with the obligations under the DIISR Funding Agreement. Following the allocation of the new funding, a new ALA Project Steering Committee has been established with

representation from CSIRO, the ALA Management Committee and DEWHA (as a key stakeholder with interest in the products from the ALA), with an observer from DIISR.

The role of the ALA Project Steering Committee is to:

- In partnership with the ALA Management Committee, foster an environment of cooperation and collaboration within the Australian scientific community that supports the successful delivery of the Atlas of Living Australia
- In partnership with the ALA Management Committee, support effective interaction between the Atlas of Living Australia Project, Australian Government departments (especially DIISR and DEWHA) and other stakeholders who will benefit from the products and services delivered by the Atlas.
- In partnership with the ALA Management Committee, consider options for future of the Atlas after the NCRIS/EIF funding ceases, and help build relationships with other potential future partners in the Atlas, including internationally;
- Ensure that the Project is delivered on time, on budget and within scope, consistent with Australian Government procurement and legal requirements and the decisions of the Atlas of Living Australia Management Committee.

2.3 Collaboration

2.3.1 NCRIS capabilities

The ALA is one of three capabilities included within NCRIS 5.2 Integrated Biological Systems (IBS) and holds funds to assist the other capabilities (Australian Phenomics Network, APN, and Australian Plant Phenomics Facility, APPF) with their data integration. During 2010-2011 the ALA will continue to provide funds for developers within each group to work on data standards, ontologies and organisation of phenomics data sets. In addition the ALA continues its collaboration with NeAT-funded Phenomics Ontology-Driven Database (PODD) project to develop a data repository and metadata catalogue for APN and APPF.

Also during 2010-2011, the ALA will build upon the existing very close relationship with the Terrestrial Ecosystem Research Network (TERN) project, specifically the Ecoinformatics and Rangelands Monitoring components. The two capabilities have now formed joint teams to work in the areas of data management, portals, geospatial analysis tools and mobilising data from the full range of potential data providers (such as State and Federal agencies). This latter activity is also expected to be conducted in partnership with ANDS.

The ALA is developing its Geospatial portal on the Integrated Marine Observing Facility (IMOS) metadata portal software. The ALA will coordinate this development through the ALA Geospatial Data Management component.

In regards to the Australian Biosecurity Intelligence Network (ABIN), the ALA participated in an ABIN-coordinated Plant Biosecurity Connectivity Workshop on 1 April 2010, which helped to define more closely some of the expected interactions between the two capabilities. Collaboration is planned in the following areas:

- Joint establishment of services to recognise and manage biodiversity data considered to have biosecurity sensitivities, including:
    - ALA sensitive data service tool to detect and handle sensitive data records
    - Collaboration with biosecurity partners to define rules and actions for handling sensitive data

    - Possible reuse of ALA sensitive data service software within ABIN secure infrastructure
- Reuse of ALA tools and services within ABIN secure infrastructure – in particular ALA taxonomic data services and tools for mapping and geospatial analysis
- Collaboration in selection, development and adoption of vocabularies and data standards for biosecurity data (joint participation in a working group)
- Joint collaboration with PaDIL (Pests and Diseases Image Library, http://www.padil.gov.au/) as a central portal for access to pest information, including:
    - Adoption and implementation of security rules for restricted access to some content
    - Shared workspaces for collaboration across the biosecurity community

2.3.2 Other Australian linkages

The ALA continues to develop relationships with collections represented through the national Councils which serve as ALA participants. Discussions are well under way to bring the Western Australian Museum (WAM), South Australian Museum (SAM) and Museum and Art Gallery of the Northern Territory (MAGNT) into membership as ALA participant organisations.

The ALA has held discussions with Birds Australia and representatives from Bird Observations and Conservation Australia to start collaboration around the integration and management of bird observational data sets across Australia. The ALA plans to fund work with Birds Australia to identify such data sets and to develop new systems to manage these data to support ornithological research and to serve as a component within the ALA data framework.

The Taxonomy Research and Information Network (TRIN) has been developing wiki-based software to enable researchers more easily to develop pages of species information. The ALA will work with this team to ensure that these tools are available and supported for use by any interested Australian research project and that the resulting data is well-integrated into the ALA.

2.3.3 International Linkages

The ALA continues to manage the payments for Australia's participation in the Global Biodiversity Information Facility (GBIF). The ALA has developed its geospatial data cache using GBIF software and will use this tool to manage the interface between Australian biodiversity data sets and the global cache maintained by GBIF.

The ALA has also progressed discussions with the Consortium for the Barcode of Life, and specifically with the Barcode of Life Database project (BOLD), to establish tools here for Australian projects to manage their barcode sequence data as part of the international barcoding programme. An additional ALA resource is being allocated from April 2010, to work on the BOLD implementation and a delivery timeline will be agreed with the BOLD team.

The ALA continues its relationship with the Encyclopedia of Life and will continue integrating relevant EOL data sets into the ALA during 20010-2011. A particular linkage will be with the Biodiversity Heritage Library (BHL). The ALA has also progressed plans to implement the Australian BHL node and expect to have a production system ready late in 2010.

The ALA has been identified as an Australian partner for two large international projects:

- 4D4Life – a European Union-funded project to accelerate the development of a global checklist of all species (through the work of the Catalogue of Life) – the ALA Australian National Checklists component will provide content and probably tools for this work.
- DataONE – a United States NSF-funded project to address long term data management for ecological data – the ALA (and TERN) will track this activity to identify tools and standards

which can be adopted in Australia.

2.4 Promotion

The ALA has developed a draft Communications Plan and is in the process of appointing a full-time Communications Manager.

The Communications Manager will have responsibility for implementing the Communications Plan and facilitating the following outcomes:

- Partners are well-informed and satisfactorily involved in the ALA project.
- Operational plans for the ALA include communication.
- A cohesive communication team across the partners that are proactively networking to achieve the goals of the ALA project through a sharing of skills and knowledge.
- Funding for communication activities that add value to the ALA project.
- Agreed messages about the ALA project across partners.
- Clear method for involvement of partners in communication planning and implementation activities in the ALA.
- Partners have increased awareness and understanding of the ALA project.
- Partners perceive the ALA project as responsive and willing to collaborate with them.

The ALA is planning for a major public release of function in September 2010 (Release 5 in the ALA Release Plan). Subject to liaison with DIISR, an earlier launch with ministerial involvement may be possible.

2.5 Access and Pricing

There are no access and pricing issues associated with the Atlas of Living Australia. The vision for the Atlas is to the greatest extent possible to provide free and open access to information. As the Atlas proceeds, it is likely that the same infrastructure will also serve for more restrictive point-to-point sharing of restricted data between data owners and authorised users. This scenario is however likely to result in reduced functionality and interoperability for the data resources so secured.

An Intellectual Property Rights Policy has been developed and was included as Attachment 5 to the 2007-2008 Business Plan. A Data Provider Agreement has been developed for signature by data providers to indicate the conditions under which they make their data available and the rights and responsibilities of both the ALA and the providers. This agreement gives the ALA sufficient rights (based on the selection of a Creative Commons Australia license) to make the data available and to merge, manipulate and derive products from the data. The ALA will provide attribution for the data and usage information back to providers if requested.

2.6 Financial and Human Resources

Balance forward (projected, including $100k projected interest)	$2,597,266
NCRIS fifth payment	$1,443,000
Total NCRIS contribution (including interest)	**$4,040,266**
CSIRO cash	$1,000,000
Australian Museum cash	$100,000
Museum Victoria cash	$100,000
Queensland Museum cash	$100,000
Tasmanian Museum and Art Gallery cash	$70,000
University of Adelaide cash	$30,000
Southern Cross University cash	$12,500

Total participant cash contribution	**$1,412,500**
NeAT DIAS-B project	$200,000
EIF funds	$10,000,000
Total other cash contribution	**$10,200,000**
Total income all sources	**$15,652,766**

CSIRO will credit the ALA with interest for the NCRIS funds held during the period. Interest will be credited for 2009-2010 during end-of-year accounting and will be reported in the 2009-2010 progress report.

The following table summarises **in-kind co-investment** by ALA participants:

CSIRO	$500,000
Australian Museum	$400,000
Museum Victoria	$850,000
Queensland Museum	$78,000
Tasmanian Museum and Art Gallery	$80,000
University of Adelaide	$18,000
Southern Cross University	$38,000
Australian Virtual Herbarium	$1,000,000
DEWHR/ABRS	$321,000
Total participant co-investment	**$3,285,000**

The following table presents the projected NCRIS expenditure 2010-2011. See *Attachment 2 - ALA Budget* for expenditure for all years, including EIF-funded outputs.

EXPENDITURE	Notes	2010-2011
Output 1 Project Office (ALA, NCRIS)		
1.1 Director salary		198,543
1.2 Director Overheads (CSIRO in kind to June 2011)		*208,998*
1.3 Programme Manager		230,400
1.4 Project Officer salary		119,801
1.5 Project Officer Overheads (CSIRO in kind to June 2011)		*126,110*
1.6 CSIRO Line Management (10%, CSIRO in kind to June 2011)		*20,097*
1.7 Travel	Staff travel for Output 1 and Output 6	30,000
1.8 Operating (PCs and consumables)		30,000
1.9 Informatics support for 5.2.1, 5.2.2		434,000
1.10 Recruitment and relocation costs		5,000
1.11 Publicity and outreach	Includes Communications Officer	259,815
1.12 Project management	Release Manager and Junior Project Manager	364,800
1.13 Project administration	Financial Administrator and PA to Director	290,772
Total Spend		**2,318,336**
Cash and in kind		***355,205***
NCRIS Spend		**1,963,132**
Output 6 - Data Integration (ALA, NCRIS)		
6.1 Technical Architect		300,799
6.2 Java Developer		0
6.3 Metadata Curator		0
6.4 DIAS-B project (NeAT in-kind)		*200,000*
6.5 DIAS-B Annotation Services developers	ALA component of costs for DIAS-B NeAT project	100,000

6.6 DIAS-B Metadata Repository developers		0
6.7 Developers	Up to 6 developers plus a Test Manager	1,174,393
6.8 Ontologies	External contract to assist ALA in use of international standards	200,000
6.9 Travel		5,500
Total Spend		**1,980,692**
Cash and in kind		***200,000***
NCRIS Spend		**1,780,692**
Output 8 - International Engagement (ALA, NCRIS)		
8.1 GBIF Membership		169,834
8.2 TDWG Membership		700
Total Spend		**170,534**
Cash and in kind		***0***
NCRIS Spend		**170,534**
Output 9 - Governance (ALA, NCRIS)		
9.1 External review of usability and function	Review funded by IBS	0
9.2 Operating / travel etc	Management Committee travel costs	15,000
Total Spend		**15,000**
Cash and in kind		
NCRIS Spend		**15,000**
Output 11 – Populating the Atlas (ALA, NCRIS)		
11.1 Australian Virtual Herbarium in-kind		*1,000,000*
11.2 CSIRO cash		*500,000*
11.3 CSIRO in kind		*500,000*
11.4 Australian Museum cash		*100,000*
11.5 Australian Museum in kind		*400,000*
11.6 Museum Victoria cash		*100,000*
11.7 Museum Victoria in kind		*850,000*
11.8 Queensland Museum cash		*100,000*
11.9 Queensland Museum in kind		*78,000*
11.10 Tasmanian Museum & Art Gallery cash		*70,000*
11.11 Tasmanian Museum & Art Gallery in kind		*80,000*
11.12 University of Adelaide cash		*30,000*
11.13 University of Adelaide in kind		*18,000*
11.14 Southern Cross University cash		*12,500*
11.15 Southern Cross University in kind		*38,000*
11.16 ABRS in kind		*321,000*
11.17 CSIRO External		*0*
Total Spend		**4,197,500**
Cash and in kind		***4,197,500***
NCRIS Spend		**0**
ALL NCRIS OUTPUTS		
Total spend		**8,682,063**
Cash and in kind		***4,752,705***
NCRIS Spend		**3,929,358**

Note: this leaves a projected positive balance of NCRIS funds unspent as of 30 June 2011 of about $211,000. The project will seek a contract variation to allow for these funds to be spent through to June 30, 2012.

See *Attachment 6 - Details of participant contributions by organisation* 2010-2011 for details of planned activities by each participant during the current period.

During 2010-2011 The following staffing positions will be funded by the ALA using NCRIS funds:

Director (Donald Hobern)	CSIRO Entomology
Programme Manager (Peter Doherty)	CSIRO Entomology
Executive Officer (Wolf Wanjura)	CSIRO Entomology
Technical Architect (David Martin)	CSIRO Entomology
Financial Administrator (Josie Grayson)	CSIRO Entomology
Release Manager (Owen Butler)	CSIRO Entomology
Junior Project Manager (TBA)	CSIRO Entomology
Communications Officer (Lynne Sealie)	CSIRO Entomology
PA to Director (TBA)	CSIRO Entomology
6 software developers (incl. 2 TBA)	CSIRO Entomology
Test Manager (TBA)	CSIRO Entomology
Mouse Phenomics Bioinformatician	ANU
Plant Phenomics Bioinformatician	University of Adelaide
Annotation Services developer (TBA)	UQ ITEE

2.7 Milestones

These milestones are based on NCRIS outputs. For a complete list of milestones structured on a quarterly basis to assist with progress reporting – please refer to Attachment 3.

Activities and Milestones for 2010- 2011	**Achievement Date**
Output 6. Data Integration	
Evaluation release for ALA stakeholders	31-Jul-2010
First public release of ALA components	30-Sep-2010
Public release of extended function	30-Nov-2010
Public release of extended function including Morphbank and demonstrators	28-Feb-2011
Public release of extended function including microbial data	30-Apr-2011
Public release of extended function	30-Jun-2011
Output 8. International Engagement	
Renewal of GBIF membership	31-Dec-2010
ALA workshops at TDWG conference	30-Nov-2010
Output 9. Governance	
10/11 Management and Steering Committee Meeting 1	30-Sep-2010
ALA NCRIS Progress Report 4	30-Sep-2010
10/11 Management and Steering Committee Meeting 2	31-Dec-2010
10/11 Management and Steering Committee Meeting 3	31-Mar-2011
10/11 Management and Steering Committee Meeting 4	30-Jun-2011
ALA NCRIS Final Report	30-Sep-2011
Output 11. Populating The Atlas	
Report on progress against activities proposed by ALA participants for 2009/2010	30-Sep-10

2.8 Attachments

There is no confidential information attached, although several supplementary attachments are provided in appendices.

Donald Hobern
Project Director

16 April 2010

3. Attachments

3.1 Attachment 1 – ALA Implementation Plan

Note: this section includes all components planned for ALA development in 2009-2011, including those to be funded from NCRIS funds and those to be funded from EIF funds.

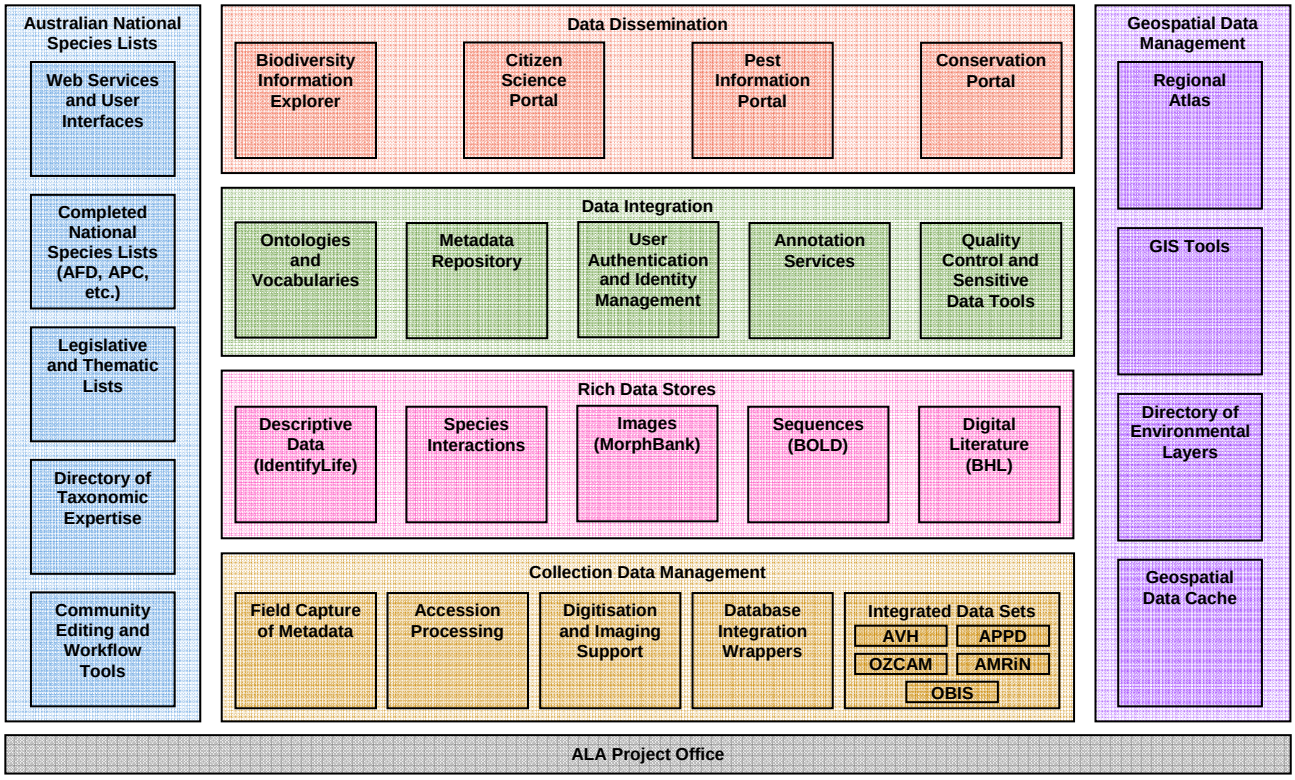


Figure 1: ALA project components

The ALA delivered the 2009-2010 Business Plan in November 2009 to reflect activities to be carried out using both the original NCRIS funds and the additional EIF funding. These planned activities remain unchanged.

This section provides an overview of all planned components to reflect the high degree of interconnectedness between these modules. Those components to be funded from ALA NCRIS funds in 2010-2011 are marked "ALA-NCRIS". Those components to be funded from ALA EIF funds are marked "ALA-SS". (Note that, during 2011-2012, both sets of components will continue to be funded from ALA EIF funds.)

The ALA will deliver research infrastructure organised into six project component areas:

1. **Collection Data Management** (ALA-SS) – create and develop tools and services to optimise the data supply chain through Australia's natural history collections.
2. **Rich Data Stores** (ALA-SS) – create and develop shared infrastructure to manage and maintain biodiversity data sets on behalf of Australian institutions and projects.
3. **Australian National Species Lists** (ALA-SS) – create and develop enhanced tools and services to organise Australian biodiversity data according to a shared understanding of the species found in the country and of their classification.
4. **Geospatial Data Management** (ALA-SS) – create and develop shared models, tools and

services to ensure interoperability of all geospatial data accessed through the ALA and compatibility with data shared through related NCRIS capabilities (particularly TERN and IMOS).
5. **Data Integration** (ALA-NCRIS) – create and develop core services to catalogue and index Australian biodiversity data resources to maximise their accessibility and usefulness to researchers, policy-makers and the public.
6. **Data Dissemination** (ALA-SS) – create and develop web portals and applications to deliver biodiversity data to end-user communities.

3.1.1 Collection Data Management (ALA-SS)

This activity will be addressed using EIF funds (ALA-SS).
The goal of this project component is to optimise the supply of data from Australia's natural history collections. Collections occupy a central role in our understanding of the current state of biodiversity in the country and in responding intelligently to future changes in that biodiversity. The herbaria, faunal and microbial collections house the reference materials and expertise required for identification of Australian organisms and for performing taxonomic research to understand the range of species found across the continent. The collections also have significant holdings of literature, images and other data of relevance to the ALA. Ecological monitoring activities use these collections for identification of material and for long-term storage of voucher specimens.

The ALA has two main reasons for supporting data management within collections. Firstly, the collections need to be able to process new specimens from field activities (e.g. long-term ecological monitoring work, environmental impact assessments) as efficiently and rapidly as possible. Data should flow smoothly from initial documentation of field work, through accessioning, curation, imaging and digitisation of specimens, and then into applications to support monitoring, conservation, land-use planning and so on. Secondly, the collections still hold millions of historical specimens for which no data are available in a digital format. Tools and processes need to be in place to enable the collections to bring as much of this information, as possible, online. For many species, such records are the richest available source of data on their historical distribution helping us to develop a clearer understanding of the environmental and habitat requirements of each.

The ALA established a working group with representatives from CHAH, CHAFC, CHAEC and CHACM, with John Tann contracted to coordinate their discussions. The working group consulted with a wide range of collections and identified a set of infrastructure components for the ALA to fund or develop to improve the capacity of collections to derive reliably-managed data, images and other information resources from specimens. The group provided its recommendations in October 2009 and implementation of those recommendations is continuing.

The ALA Collection Data Management component includes activities in the following areas:

1. **Field capture of metadata** – create and develop tools and processes to ensure that basic information is captured when specimens are collected (including locality, coordinates, date, collecting team, methods, taxonomic groups, etc.). Centralised management of such metadata can simplify subsequent digitisation activities, allow preliminary information to be represented through GIS tools, advertise the existence of materials to researchers, and improve subsequent integration of specimen records as part of a single sample.
2. **Accession processing** – create and develop tools and processes to maximise the capture of information (data and images) as new materials are added to collections.
3. **Digitisation and imaging support** – create and develop tools and processes to improve the efficiency of data and image capture for all collections. These activities are expected to include development of tools to enable researchers and other users to annotate images.

4. **Database integration wrappers** – improve the availability and reliability of software packages to assist collections and other holders of biodiversity data to connect to the ALA in well-structured formats. This work will also support the ongoing development of the AVH and OZCAM as integrated caches of specimen records from herbaria and faunal collections respectively. Work is also proposed to identify simpler methods of sharing data amongst the collections.
5. **Integrated data sets** – create and develop tools to support the ongoing operation of the key national integrated caches of collection-based biodiversity data (including Australia's Virtual Herbarium, AVH; Online Zoological Collections of Australian Museums, OZCAM; Australian Plant Pest Database, APPD; Australian Microbial Resources Information Network, AMRIN; and Ocean Biogeographic Information System, OBIS). These data sets provide efficient community-driven hubs to organise and integrate data to feed into the ALA. Consequently, the ALA will partner with these activities to ensure their robustness, compatibility and long-term viability. The ALA will also facilitate the creation of new integrated data sets representing other groups, such as university herbaria and seedbanks.

3.1.2 Rich Data Stores (ALA-SS)

This activity will be addressed using EIF funds (ALA-SS).
Many classes of biodiversity data are complex and difficult to manage in a consistent way between different institutions. In particular, many institutions lack sufficiently robust and flexible web infrastructure to publish identification keys, images, sequence data and digital literature online. The ALA, therefore intends to develop a set of shared national repositories to handle these more complex data types. Each of these repositories will be enhanced to simplify the upload of data by partner institutions and to facilitate the presentation of this data both from within ALA portals and also within institutional web sites. These repositories will manage data as a set of projects from contributing institutions, each such project being branded to identify the source institution and the associated project metadata.

Five major sub-components have been identified as part of the ALA Rich Data Stores activity:

1. **Descriptive Data** - The ALA is working with the Encyclopedia of Life and the University of Queensland Centre for Biological Information Technology (CBIT) on IdentifyLife (http://www.identifylife.org/). This project aims to develop shared stores for species descriptive data and identification keys and to facilitate the population of these stores with the reuse of the data as a core element within the ALA infrastructure. The ALA will also provide support to ensure IdentifyLife can support descriptive data in the Delta format. Kevin Thiele (Western Australian Herbarium) has been seconded to coordinate this activity.
2. **Images** – The ALA is working with the Florida State University to establish an Australian mirror of Morphbank (http://www.morphbank.net/) biological image repository (currently around 226,000 images) and to enhance it to support multimedia content, upload/download interfaces for Australian projects and include seamless integration with the ALA. Morphbank provides a platform for disparate projects to share their images and to manage a wide range of metadata for each image, including placement within a taxonomic hierarchy, geospatial data and morphological tags.
3. **Sequences** – The ALA plans to establish a national mirror of the Barcode of Life Database (BOLD, http://www.barcodinglife.org/views/taxbrowser_root.php, currently around 688,000 records) and to enhance upload/download interfaces for Australian projects to store molecular sequences (barcode sequences and others). Many Australian projects are already contributing to thematic barcode networks (e.g. AllLeps, FishBOL, TreeBOL). An Australian node would give the opportunity to provide an integrated national view of all of this data and data from other Australian sequencing projects. It would also provide a focus for integrating sequence data into

the ALA's GIS capabilities.

4. **Digital Literature** – The ALA plans to establish a national mirror of the Biodiversity Heritage Library (BHL, http://www.biodiversitylibrary.org/). This digital biodiversity literature archive (currently around 28.1 million pages) aims to enhance the upload/download interfaces for Australian projects. The BHL platform allows publications to be accessed in a range of formats. New BHL projects are under way or starting in China, Europe and Japan. All of these will contribute to the global pool of accessible digital literature. BHL is keen to establish a replica node in Australia and to assist the ALA and its partners in planning and executing a scanning strategy here. The existence of such infrastructure could serve as a focus for project-based contributions of relevant literature and to explore collaborations with Australian libraries and publishers. The ALA will also explore options for infrastructure to accelerate the scanning of relevant published materials within Australia and for automated text mining of literature for key terms and concepts.
5. **Species Interactions** – The ALA has identified a need to create tools to simplify management and access of simple data records identifying interactions between species (predator/prey, pollinator/plant, host/parasite, etc.) derived from specimen records, literature and field observations.

The ALA is working with the Morphbank, BOLD and BHL projects on the use of their software and replication of their data stores. All three of these projects already hold some data relating to Australian biodiversity. Adopting their solutions will help the ALA to minimise initial costs for developing equivalent function and will allow future costs in maintaining these open-source components to be shared between the ALA and other partners around the world. Other mirrors are also being established for these projects in other countries under similar arrangements. The ALA would then work with these projects to enhance the software to address national requirements and to integrate cleanly with processes and web infrastructure within Australian institutions. In the case of BHL, the ALA has already set up the BHL software in a development environment for further testing and analysis. The intention is to do the same for the BOLD and Morphbank platforms.

3.1.3 Australian National Species Lists (ALA-SS)

This activity will be addressed using EIF funds (ALA-SS).

All of the ALA's activities depend on understanding how to combine information on Australian biodiversity from different sources. These sources vary in their use of scientific and common names for the organisms in question. Some of these variations reflect earlier and later understanding of the taxonomy for a given group. Others reflect differing scientific opinion on the most appropriate way to interpret biological variation. Others reflect the number of species in Australia which have not yet formally been described and named or the difficulties of workers in different times and places in discovering previously published names for a species.

Information is required both on the published names for organisms and on the application of these different names to refer to currently accepted species concepts. There is also a need for global data sets (particularly for published names) and for a well-curated set of national species lists which identify all the native and non-native species found in Australia and the various names that have been applied to these species over time.

These national species lists provide the framework for the ALA to integrate its data and in effect serve as the primary keys for all data records. The ALA consequently depends on these lists as a critical part of the national biodiversity informatics infrastructure. These lists are also of great importance to state and federal agencies and other organisations in structuring their own data sets and in supporting the merging of data from multiple sources.

This information exists in a number of national and international data sets, in particular:

- Australian Plant Name Index (APNI) – published names for Australian plants.
- Australian Plant Census (APC) – national consensus of the species of plants found in Australia and the various published names relating to each of these species (partial checklist – major families to be added). NOTE: To date an APC review has only been applied to approximately half of the name usage concepts listed in APNI.
- Australian Faunal Directory (AFD) – national consensus of the species of animals found in Australia and the various published names relating to each of these species (partial checklist – major families to be added).
- AusMoss – published names.
- Census of Freshwater Algae of Australia – published names.
- Australian Marine Algal Name Index – published names.
- Checklist of Australian Liverworts and Hornworts – national consensus of liverwort/hornwort species found in Australia and the various published names relating to these species.
- Interactive Catalogue of Australian Fungi – published names.
- International Plant Name Index (IPNI) – published names of world plants.
- Index Fungorum (IF) – published names of world fungi.
- ZooBank – published names of world animals (new resource, only partially populated).
- Catalogue of Life (CoL) – global consensus view of species from all groups and the various published names relating to each of these species (partial checklist – major groups to be added).
- World Register of Marine Species (WoRMS) – global consensus of species from all marine groups and the various published names relating to each of these species (partial checklist, will feed into CoL).
- Interim Register of Marine and Non-marine Genera (IRMNG) – global list of genus-level names from all groups (maintained by CSIRO Marine, 90-95% complete).

As indicated, most of the existing resources are currently incomplete, reflecting the significant history of taxonomic work preceding the Internet age. However, there is significant activity globally in improving and integrating these data sets. The ALA has been identified as a partner in the latest phase of activity for the Catalogue of Life.

The ALA Australian National Species List activity will create and develop infrastructure around the core data sets on Australian published names and species. It will also address the use of these lists as data management tools in government and other agencies. The goals for the activity are to:

- Engage taxonomists to complete the national species lists (APNI/APC, AFD, etc.) for all groups to the fullest extent possible. Contracts have been placed with CHAH and ABRS to coordinate this work.
- Build a distributed editing framework to support this activity and to facilitate workflows for approval and effort-logging.
- Develop tools to allow other classifications to be related to these species lists (CoL, red lists, CITES, existing classifications from databases, etc.).
- Integrate TAXAMATCH (http://www.cmar.csiro.au/datacentre/taxamatch.htm) and known synonyms at all stages to guide users and tools to appropriate species names.
- Use CoL and IRMNG to provide at least working answers for the appropriate placement of names not currently included on national species lists.
- Support informal names of various kinds (common names, unpublished names for species recorded in field work, etc.).

- Manage a stable system of unique identifiers for species concepts sufficient to allow a user or tool to track future taxonomic changes for concepts for which they have stored such an identifier.
- Provide a range of web services and browser interfaces to access and explore the data.
- Provide interfaces for government agencies and others to simplify associating their own database records with the species lists.
- Provide interfaces for approved agencies to request handling for names not yet included in the checklists.
- Provide workflow processing to assign unhandled names to the appropriate taxonomic expert and update the checklists to place the name as a valid species name, synonym, misspelling, etc.
- Integrate data from Australian species lists into the global data sets such as CoL and WoRMS.

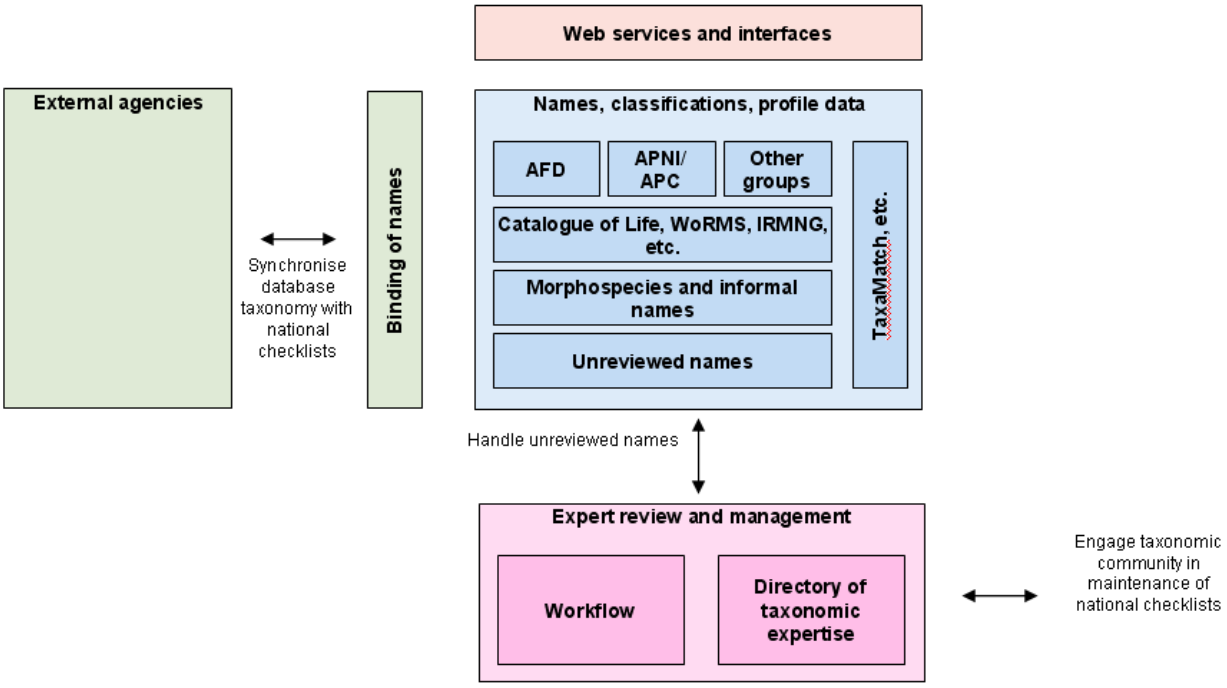


Figure 2: High-level model for Australian National Species Lists component

Five major sub-components have been identified for this activity:

1. **Community Editing and Workflow Tools** – create and develop software and processes to support collaborative editing and maintenance of these lists.
2. **Directory of Taxonomic Expertise** – create a registry of taxonomists and others with expertise to maintain components within these lists (and to support other information needs).
3. **Completed National Species Lists** – develop national species lists to the fullest extent possible.
4. **Legislative and Thematic Lists** – create and develop tools to support mapping other species lists (lists of species of legislative significance, state lists, alternative taxonomic views, etc.) against the national species lists.
5. **Web Services and User Interfaces** – create and develop tools to support the use of data from these lists by the ALA and other user groups.

3.1.4 Geospatial Data Management (ALA-SS)

This activity will be addressed using EIF funds (ALA-SS).

All project elements dealing with the organisation, integration, analysis and visualisation of geospatial data are being coordinated as a single project area, to simplify coordination with TERN and IMOS and collaboration with other groups in Australia developing solutions in the same area (especially AVH and OZCAM). The goal is to deliver a well-integrated reusable set of services and to ensure that any project developing GIS outputs using Australian data can benefit from tools and visualisations developed by other projects.

The following components are already under development with the existing ALA work programme:

1. **Geospatial Data Cache** – the ALA deployed an instance of the GBIF Data Portal software customised to provide richer information management within the national context (mapping all records against smaller divisions of the continent such as local government areas, water catchments, nature reserves and ecoregions, use of Australian national checklists). This cache is a repository of biological observations from all sources (AVH, OZCAM, other collections, ecological field work, amateur observations, etc.) and will support a range of spatial services. The test version of this portal is online at http://data.ala.org.au/.
2. **GIS Tools** – The ALA will collaborate with IMOS, TERN and other relevant projects to develop an effective suite of spatial tools that take advantage of the integration of biological, environmental and contextual/political data. For example, spatial modelling tools will use biological observations and environmental data to generate probability distribution surfaces. Priority will be placed on techniques that integrate biological, environmental and contextual data.
3. **Directory of Environmental Layers** – This directory will contain a wide variety of national scales of contextual layers (landuse, land cover etc.) and environmental layers (climate, soil, vegetation classes etc.).
4. **Regional Atlas** – The ALA will provide a general-purpose portal for the mapping of species distributions and for species reports by a range of contextual and environmental variables. The foundation code uses the IMOS Ocean Portal to provide a rich platform for visualising and analysing spatial data. Development and integration with the Geospatial Data Cache, GIS Tools and Directory of Environmental Layers will be completed in collaboration with IMOS, TERN and others using the same code base.

These activities will be enhanced to support site-based data collection (i.e. batches of specimens or observations sharing the same collecting/recording metadata) and to form components into integrated and interoperable cross-capability services. Additionally the ALA, TERN and IMOS will collaborate to ensure that suitable catalogues of relevant environmental data layers are accessible and exposed to allow optimal reuse of such data resources (**Directory of Environmental Layers**).

The ALA has engaged Lee Belbin (Hobart) as project lead for the ALA Geospatial Data Management component and has initiated discussions with TERN, IMOS, BioMaps (Australian Museum), CSIRO Entomology, the Australian Institute of Marine Science and others to define technical requirements. The ALA is working with IMOS and others in the development of the geospatial data portal software and contributing to furthering its development. Brendan Ward from IMOS has been engaged to project manage the ALA development in addition to a team of dedicated developers.

A preparatory workshop to address requirements for spatial analysis and data processing tools has been held and another planned to address requirements for environmental layers.

3.1.5 Data Integration (ALA-NCRIS)

This activity will be addressed using NCRIS funds (ALA-NCRIS).
Data integration activities represent most the core tasks funded under the original ALA NCRIS

funding. The focus is on the development of tools and services to index primary information sources and provide integrated views to enable users to select and access those resources which are most relevant to their concerns.

The following components are under development:

1. Ontologies and Vocabularies – data integration within the ALA and with other projects (e.g. AVH, OZCAM, GBIF, EOL, OBIS) depends on a shared understanding of the structure of biodiversity data and agreement about the data elements which can be shared. The ALA is working with TDWG and international projects to set up tools to engage the community in developing and maintaining the ontologies and vocabularies required for this purpose. These structures will be particularly important to the Biodiversity Information Explorer (BIE) and will provide the models to be used within that tool for organising Australian biodiversity information.

2. Metadata Repository – The core component within the ALA's data integration programme will be the Metadata Repository. It will serve as a catalogue of biodiversity information resources (databases, documents, images, etc.) with provider-supplied metadata describing the origins and nature of each resource, but will be extended to link these resources to the species to which they relate, the geographic regions which they cover and to model the relationships between species, regions, habitats, descriptive characters, etc. (using information from tools such as the ALA Geospatial Data Cache). This will allow the ALA to produce web pages giving overviews of the available information relating to each species, region, habitat, etc. The Metadata Repository will therefore act as the engine providing information links to the proposed Data Dissemination components (especially the Biosecurity Portal).

3. User Authentication and Identity Management – The ALA will require the ability to authenticate users for many different purposes: to allow data providers to manage the metadata for their resources; to allow users to identify themselves to make annotations or provide additional data; for taxonomists to contribute to the Australian national checklists; and so on. Building an integrated concept of the expertise of each individual will also allow the ALA to improve its use of the information supplied by each user. The ALA has already held discussions with the Australian Access Federation (AAF) on the use of its services as the identity management and authentication framework for those users who belong to AAF-enabled organisations.

4. Annotation Services – The ALA has received funding from the NCRIS Platforms for Collaboration capability's NeAT programme to develop annotation services to enhance the quality of data and to enable end users to contribute new information to the network. This work is being carried out at the University of Queensland School of Information Technology and Electrical Engineering and early versions of some of the tools have been integrated into the GBIF Data Portal software at http://data.ala.org.au/. As the ALA proceeds, these tools will be used in many ways, including capturing user suggestions for corrected values within data records, free-text user comments, user tagging of species with descriptive terms, and so on.

5. Data Quality and Sensitive Data Tools – The ALA contracted a review of concerns around potentially sensitive data within state conservation agencies, natural history collections and biosecurity activities. The goal is to develop best practice recommendations for the handling of occurrence records of conservation or biosecurity concern (e.g. reduction of precision of coordinates for records of species considered endangered in the state where they have been recorded, or diverting records of pest species with implications for Australian trade to the relevant authorities). The ALA will provide easy-to-use services to scan sets of records (e.g. as a spreadsheet) to evaluate any possible issues and report back to the data provider. This will be an important tool to help data providers become comfortable about sharing data and allow the broader community to develop consistent approaches to handling records for sensitive taxa. The tool will also support a wide range of additional data validation and other checks. In this form it will become a major component in the ALA's approach to improving data quality. Records with

issues can be reported to the data holders and can automatically be annotated with notes or suggested corrections. End users will also be able to use annotation tools to contribute to data quality. Ultimately all such annotations should be handled through workflows which capture responses from the data providers.

In addition the ALA has established a team to assist data providers to share their data. This assistance will include:

1. IT Infrastructure to support sharing data – The ALA is developing infrastructure to simplify the mobilisation of data. This will enable potential contributors who may not have had the resources or expertise to share their data using simple mechanisms that do not require the installation and configuration of complex software. This will be achieved through the implementation of a landing area to receive file exports of data (uploaded via a web interface, FTP or email) and an ALA data sharing access point (IPT instance).
2. Self-service data registration – To manage the ongoing resource overhead required to integrate new data sets into the ALA, self service capabilities will be developed. The process will be fully automated, with new contributors using an online tool kit to register, map and upload their information into the ALA. The ALA will create an online registration and agreement tool that allows data suppliers to control the upload of data.
3. Data sharing agreement – The ALA is developing a "Data Provider Agreement" that will allow contributors to release data under a license that enables sharing and re-use while acknowledging the owner of the data and allowing them to retain control over the IP. Contributors can also choose to limit some uses of the data e.g. non-commercial.
4. Supporting documentation – The ALA will develop a contributor's information pack and other communications and support materials. This documentation will explain to contributors and end-users the key concepts behind the ALA and data sharing. It will also provide a consistent message to stakeholders supporting the goals and principles of the ALA. Support materials, including manuals and step-by-step guides will be developed to assist contributors and users in sharing data and effectively utilising ALA tools.

3.1.6 Data Dissemination (ALA-SS)

This activity will be addressed using EIF funds (ALA-SS).
The ALA aims to organise Australian biodiversity data in forms which meet user needs, particularly in contexts in which it can support decision-making processes.

The ALA is already developing a general-purpose data access tool to support any users of biodiversity information:

1. Biodiversity Information Explorer – An interconnected overview of all available data resources for any species, habitat, geographic region, etc. This will be based on the data index created in the Metadata Repository component.

In addition, the ALA has identified three focus areas for more targeted use of biodiversity data:

2. Conservation Portal – This will be a specific application of the data managed through the ALA Geospatial Data Management component and will focus on delivery of key indicator data for the reserves in the Australian national reserve system and more generally for the state of Australian habitats. Site-based data, particularly from survey work by DEWHA in the National Reserve System (NRS) and from the TERN Rangelands monitoring activity, along with collection data, will be integrated to support clustering and comparison of sites by their community composition and to evaluate the health and comprehensiveness of the NRS. The final deliverable should serve as a

toolbox and suite of standard reports for each reserve or habitat.

3. Pest Information Portal – This is intended to provide a focus for organising information on species of biosecurity concern (including distribution modelling, species fact sheets, literature, etc.) to address needs within AQIS, ABIN, etc. This will build on the work of the Pests and Diseases Image Library (PaDIL, http://www.padil.gov.au/).

4. Citizen Science Portal – This is a two-way portal, designed to engage members of the public in data recording projects. Amateur naturalists will be given the opportunity to upload and manage observational data and will be placed in contact with organisations, projects and researchers with activities to which they can contribute. This work will build on software components from the ClimateWatch (http://www.climatewatch.org.au/) citizen science project developed by Gaia Resources using ALA-NCRIS funds. The ALA has identified a number of existing projects in DEWHA, DAFF, ABIN, state museums and elsewhere which will benefit from this shared infrastructure. A joint project with Museum Victoria will also deliver mobile solutions to this Citizen Science Portal. The ALA conducted a review and requirements project late in 2009. A detailed project plan has been submitted and a contract has been produced for Gaia Resources to implement the Citizen Science Portal with release 5 of the ALA, in September, 2010. Further refinement will take place after this release.

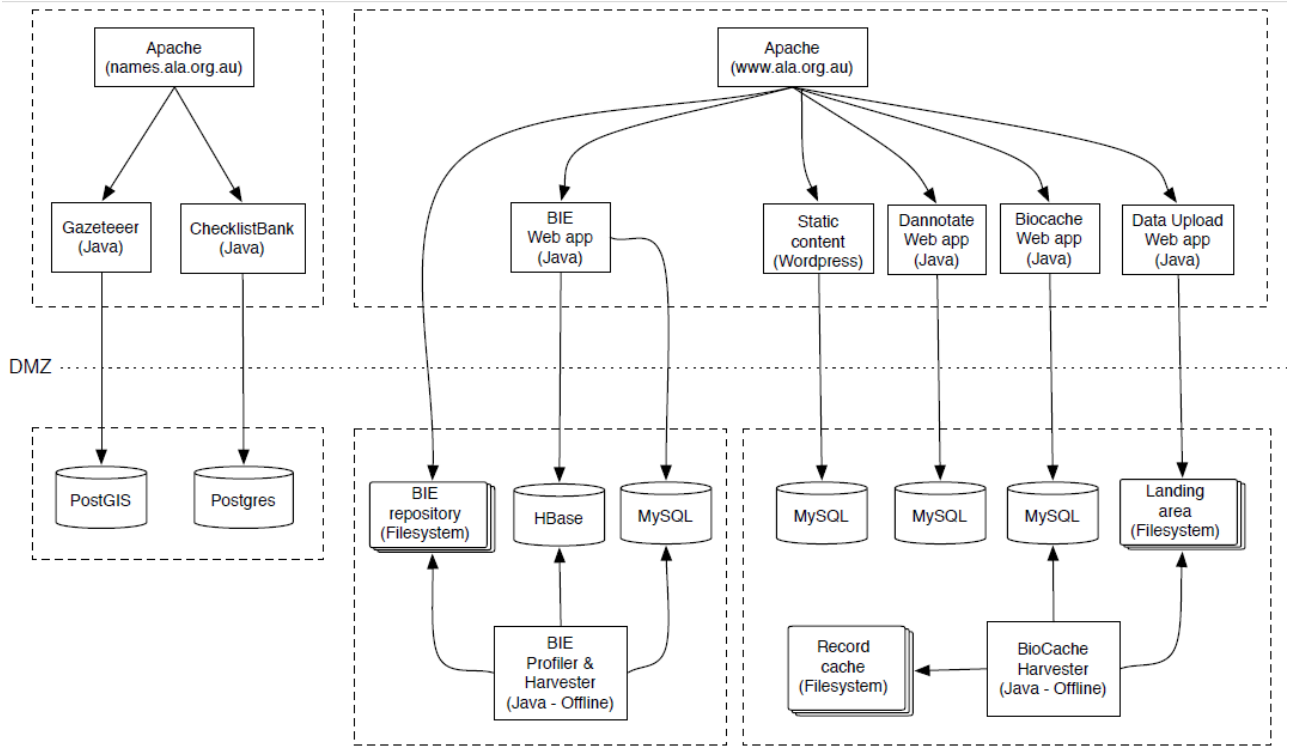
3.1.7 Hardware and Networking

The ALA is currently using the following servers provided by CSIRO IM&T:

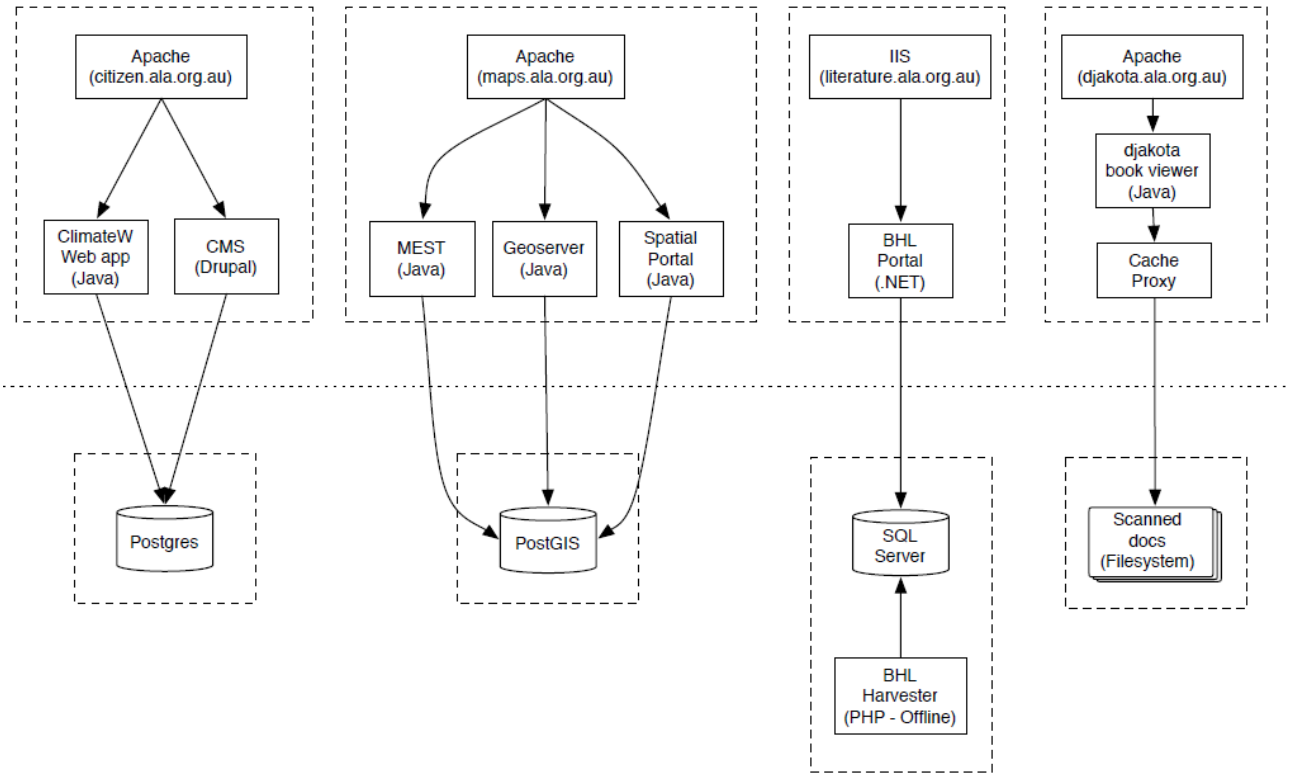
Machine	Role	Services	Specification
alaprodweb1-cbr.vm.csiro.au	Production web server	Website (www.ala.org.au) GIS Portal (data.ala.org.au) Mapping Services (maps.ala.org.au) Annotation services (annotate.ala.org.au)	Apache/Tomcat 4GB, 2 CPU, 200GB of storage
Alaproddb1-cbr.vm.csiro.au	Production database	Database for production services	MySQL 8GB, 2 CPU, 500GB of storage
alatstweb1-syd.nexus.csiro.au	Test web server	Development versions of GIS Portal and Mapping Services	Apache/Tomcat 4GB, 2 CPU, 200GB of storage
alatstdb1-syd.nexus.csiro.au	Test database	Database for development services	MySQL 4GB, 2 CPU, 500GB of storage
Alaslvweb2-cbr.vm.csiro.au	Indexing web server	Java indexing processes	Apache/Tomcat 4GB, 2 CPU, 200GB of storage
alaslvddb1-cbr.vm.csiro.au	Indexing database	Database for Java indexing processes	MySQL 4GB, 2 CPU, 500GB of storage
diasbdev1-cbr.vm.csiro.au	DIAS-B development server	Web server and database for development of Metadata Repository	Tomcat, MySQL, Fedora Commons 4GB, 2 CPU, 200GB of storage
diasbtest1-cbr.vm.csiro.au	DIAS-B test server	Web server and database for test of Metadata Repository	Tomcat, MySQL, Fedora Commons 4GB, 2 CPU, 200GB of storage
ala01.eresearch.sa.edu.au	Development machine	Spatial portal development machine	4GB, 2CPU, 250GB of storage
ala02.eresearch.sa.edu.au	Development machine	Landing area for new data resources	Apache/SFTP Server 4GB, 2CPU, 250GB of storage
ala03.eresearch.sa.edu.au	Development machine	Checklist bank and name processing tools	POSGRES DB 4GB, 2CPU, 250Gb of storage
ala04.eresearch.sa.edu.au	Development machine	Biodiversity Information Explorer development machine	4GB, 2CPU, 250GB of storage

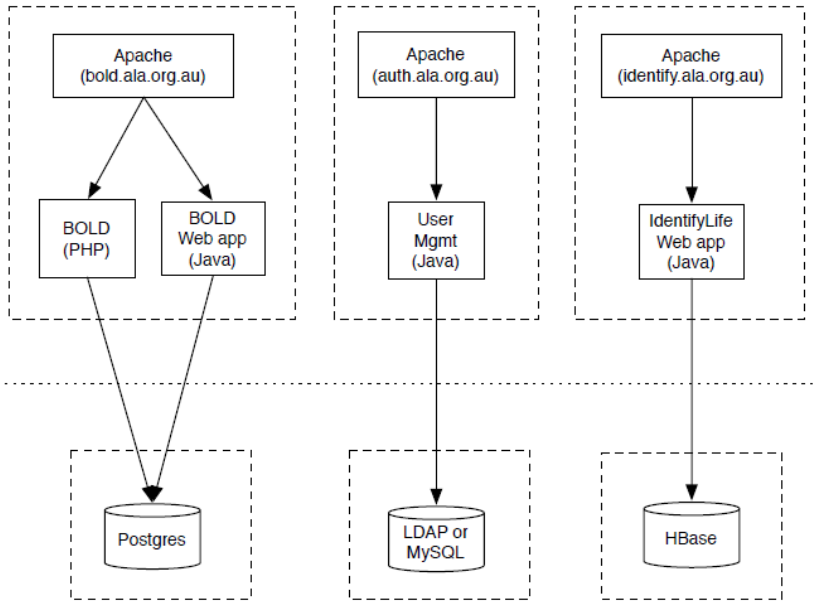
During 2010-2011, the ALA will work with ARCS to plan and deploy additional storage and servers located around Australia to reflect the locations of activities developing ALA components.

The following diagrams show the planned deployment of applications across servers.



Notes: Dotted lines indicate a VM. Where multiple MySQL and PostgreSQL/PostGIS DBs exist in the same VM, it is expected they will be using the same RDBMS instance/installation. For Java web applications, the platform is expected to be Tomcat version 6. The assumed default VM with be Linux Debian where Windows server is not required.




Apache
(bold.ala.org.au)
BOLD
(PHP)
BOLD
Web app
(Java)
Apache
(auth.ala.org.au)
User
Mgmt
(Java)
Apache
(identify.ala.org.au)
IdentifyLife
Web app
(Java)
Postgres
LDAP or
MySQL
HBase

3.2 Attachment 2 - ALA Budget

Note: this section includes all components planned for ALA development in 2010-2011, including those to be funded from NCRIS funds and those to be funded from EIF funds.

3.2.1 Revised budget 2009-2012

The following table summarises projected income and expenditure of both NCRIS and EIF funds throughout the ALA project to June 2012. Italicised figures are projections.

	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Total
INCOME							
NCRIS	1,472,000	1,819,000	1,951,000	1,548,000	1,443,000	-	8,233,000
EIF	-	-	-	10,000,000	10,000,000	10,000,000	30,000,000
NCRIS Interest	-	118,378	143,600	*100,000*	*100,000*	-	*461,978*
EIF Interest	-	-	-	*100,000*	*200,000*	*100,000*	*400,000*
Total	1,472,000	1,937,378	2,094,600	*11,748,000*	*11,743,000*	*10,100,000*	*39,094,978*
EXPENDITURE							
NCRIS	-	531,183	1,401,282	*2,622,247*	*3,929,358*	-	*8,484,070*
EIF	-	-	-	*8,510,923*	*12,176,659*	*9,753,082*	*30,440,664*
Total	-	531,183	1,401,282	*11,133,170*	*16,106,017*	*9,753,082*	*38,924,734*
BALANCE							
Annual NCRIS balance	1,472,000	1,406,195	693,318	*-974,247*	*-2,386,358*	-	*210,908*
NCRIS balance forward	1,472,000	2,878,195	3,571,513	*2,597,266*	*210,908*	-	-
Annual EIF balance	-	-	-	*1,589,077*	*-1,976,659*	*346,918*	*-40,664*
EIF balance forward	-	-	-	*1,589,077*	*-387,582*	*-40,664*	-
Total annual balance	1,472,000	1,406,195	693,318	*614,830*	*-4,363,017*	*346,918*	*170,244*
Total balance forward	1,472,000	2,878,195	3,571,513	*4,186,343*	*-176,674*	*170,244*	-

The following table shows the breakdown of projected expenditure of both NCRIS and EIF funds for the three years 2009-2012. Costs covered from NCRIS funds in 2009-2011 are coloured gold and costs covered from EIF funds are coloured green. Outputs 1, 6, 8 and 9 will be funded by NCRIS in 2009-2011. Output 11 related to the in-kind contributions committed by the ALA participants under the NCRIS funding agreement. All remaining Outputs and all activity for Outputs 1, 6, 8 and 9 in 2011-2012 will be funded by EIF.

EXPENDITURE	Notes	2009-2010	2010-2011	2011-2012	2-yearTotal
Output 1 Project Office (ALA, NCRIS)					
1.1 Director salary		189,089	198,543	208,470	**407,014**
1.2 Director Overheads (CSIRO in kind to June 2011)		*199,046*	*208,998*	219,448	**428,446**
1.3 Programme Manager		230,400	230,400	264,960	**495,360**
1.4 Project Officer salary		108,910	119,801	131,782	**251,583**
1.5 Project Officer Overheads (CSIRO in kind to June 2011)		*114,645*	*126,110*	138,721	**264,830**
1.6 CSIRO Line Management (10%, CSIRO in kind to June 2011)		*18,721*	*20,097*	21,574	**41,671**
1.7 Travel	Staff travel for Output 1 and Output 6	50,000	30,000	30,000	**60,000**
1.8 Operating (PCs and consumables)		50,000	30,000	30,000	**60,000**
1.9 Informatics support for 5.2.1, 5.2.2		434,000	434,000	0	**434,000**
1.10 Recruitment and relocation costs		5,000	5,000	0	**5,000**
1.11 Publicity and outreach	Includes Communications Officer	103,795	259,815	197,055	**456,870**
1.12 Project management	Release Manager and Junior Project	146,880	364,800	419,520	**784,320**

	Manager				
1.13 Project administration	Financial Administrator and PA to Director	184,156	290,772	319,850	**610,622**
Total Spend		**1,834,642**	**2,318,336**	**1,981,379**	**4,299,715**
Cash and in kind		***332,412***	***355,205***	***0***	**355,205**
NCRIS Spend		**1,502,230**	**1,963,132**		**1,963,132**
EIF Spend				**1,981,379**	**1,981,379**
Output 2 - Collection Data Management (ALA-SS, EIF)					
2.1 Project lead		211,200	211,200	242,880	**454,080**
2.2 Travel and workshops		46,972	14,300	15,730	**30,030**
2.3 Implementation		1,452,251	2,822,027	1,710,000	**4,532,027**
2.4 Provider liaison	Up to 4 staff developing data provision agreements and providing technical assistance to data providers	379,476	833,111	633,280	**1,466,391**
Total Spend		**2,089,898**	**3,880,638**	**2,601,890**	**6,482,528**
Cash and in kind		***0***	***0***	***0***	**0**
EIF Spend		**2,089,898**	**3,880,638**	**2,601,890**	**6,482,528**
Output 3 - Rich Data Stores (ALA-SS, EIF)					
3.1 Project leads		93,735	248,966	268,911	**517,878**
3.2 Business analyst		0	0	0	**0**
3.3 Developers	Up to 7 developers plus external contracts for development of tools for species interactions and Delta enhancements	700,665	1,924,832	884,205	**2,809,037**
3.4 Travel and workshops		151,700	249,800	251,780	**501,580**
3.5 Test/commissioning projects		0	400,000	0	**400,000**
Total Spend		**946,100**	**2,823,599**	**1,404,896**	**4,228,495**
Cash and in kind		***0***	***0***	***0***	**0**
EIF Spend		**946,100**	**2,823,599**	**1,404,896**	**4,228,495**
Output 4 - Australian National Checklists (ALA-SS, EIF)					
4.1 Project leads		127,600	139,200	27,840	**167,040**
4.2 Business analyst		153,600	192,000	0	**192,000**
4.3 Developers	Up to 6 developers	587,828	782,160	183,264	**965,424**
4.4 Travel and workshops		30,000	20,000	5,000	**25,000**
4.5 Hardware		15,000	40,000	0	**40,000**
4.6 Data analysts	Up to 3 staff assisting with integration of disparate data sets	132,800	199,200	39,840	**239,040**
4.5 ABRS contract		1,962,820	590,038	143,000	**733,038**
4.6 CHAH contract		1,169,087	901,285	0	**901,285**
Total Spend		**4,178,735**	**2,863,883**	**398,944**	**3,262,827**
Cash and in kind		***0***	***0***	***0***	**0**
EIF Spend		**4,178,735**	**2,863,883**	**398,944**	**3,262,827**
Output 5 - Geospatial Data Management (ALA-SS, EIF)					
5.1 Project lead		211,200	211,200	48,576	**259,776**
5.2 Business analyst		0	0	0	**0**
5.3 Developers	Up to 5 developers plus external contract for interface design	303,610	632,200	165,600	**797,800**
5.4 Expert modellers		0	0	0	**0**
5.5 Travel and workshops		64,500	48,500	19,845	**68,345**
Total Spend		**579,310**	**891,900**	**234,021**	**1,125,921**
Cash and in kind		***0***	***0***	***0***	**0**

EIF Spend		**579,310**	**891,900**	**234,021**	**1,125,921**
Output 6 - Data Integration (ALA, NCRIS)					
6.1 Technical Architect		273,453	300,799	330,879	**631,678**
6.2 Java Developer		0	0	0	**0**
6.3 Metadata Curator		0	0	0	**0**
6.4 DIAS-B project (NeAT in-kind)		*400,000*	*200,000*	0	**200,000**
6.5 DIAS-B Annotation Services developers	ALA component of costs for DIAS-B NeAT project	45,000	100,000	0	**100,000**
6.6 DIAS-B Metadata Repository developers		0	0	0	**0**
6.7 Developers	Up to 6 developers plus a Test Manager	539,036	1,174,393	1,119,915	**2,294,308**
6.8 Ontologies	External contract to assist ALA in use of international standards	20,800	200,000	0	**200,000**
6.9 Travel		2,250	5,500	6,050	**11,550**
Total Spend		**1,280,540**	**1,980,692**	**1,456,844**	**3,437,536**
Cash and in kind		***400,000***	***200,000***	***0***	**200,000**
NCRIS Spend		**880,540**	**1,780,692**		**1,780,692**
EIF Spend				**1,456,844**	**1,456,844**
Output 7 - Data Dissemination (ALA-SS, EIF)					
7.1 Project leads		0	0	0	**0**
7.2 Business analyst		101,440	30,720	0	**30,720**
7.3 Developers	Up to 2 developers plus external contracts for citizen science components	310,400	812,320	843,520	**1,655,840**
7.4 Travel and workshops		50,000	12,000	10,000	**22,000**
7.5 Test/commissioning projects	*Acacia* and fish as focus areas for integration and presentation of species information	60,000	120,000	120,000	**240,000**
7.6 Documentation	Up to 2 technical writers to produce manuals and online tutorials	51,840	345,600	198,720	**544,320**
Total Spend		**573,680**	**1,320,640**	**1,172,240**	**2,492,880**
Cash and in kind		***0***	***0***	***0***	**0**
EIF Spend		**573,680**	**1,320,640**	**1,172,240**	**2,492,880**
Output 8 - International Engagement (ALA, NCRIS)					
8.1 GBIF Membership		169,834	169,834	176,628	**346,462**
8.2 TDWG Membership		4,642	700	840	**1,540**
Total Spend		**174,476**	**170,534**	**177,468**	**348,002**
Cash and in kind		***0***	***0***	***0***	**0**
NCRIS Spend		**174,476**	**170,534**		**170,534**
EIF Spend				**177,468**	**177,468**
Output 9 - Governance (ALA, NCRIS)					
9.1 External review of usability and function	Review funded by IBS	0	0	0	**0**
9.2 Operating / travel etc	Management Committee travel costs	65,000	15,000	15,000	**30,000**
Total Spend		**65,000**	**15,000**	**15,000**	**30,000**
Cash and in kind					**0**
NCRIS Spend		**65,000**	**15,000**		**15,000**
EIF Spend				**15,000**	**15,000**
Output 10 - Network Infrastructure (ALA-SS, EIF)					
10.1 Hardware	Procured through ARCS	100,000	300,000	200,000	**500,000**
10.2 Hardware support	System administration, server set-up	43,200	96,000	110,400	**206,400**
Total Spend		**143,200**	**396,000**	**310,400**	**706,400**

Cash and in kind		***0***	***0***	***0***	**0**
EIF Spend		**143,200**	**396,000**	**310,400**	**706,400**
Output 11 – Populating the Atlas (ALA, NCRIS)					
11.1 Australian Virtual Herbarium in-kind		*1,000,000*	*1,000,000*		**1,000,000**
11.2 CSIRO cash		*500,000*	*500,000*		**500,000**
11.3 CSIRO in kind		*500,000*	*500,000*		**500,000**
11.4 Australian Museum cash		*100,000*	*100,000*		**100,000**
11.5 Australian Museum in kind		*400,000*	*400,000*		**400,000**
11.6 Museum Victoria cash		*100,000*	*100,000*		**100,000**
11.7 Museum Victoria in kind		*850,000*	*850,000*		**850,000**
11.8 Queensland Museum cash		*100,000*	*100,000*		**100,000**
11.9 Queensland Museum in kind		*78,000*	*78,000*		**78,000**
11.10 Tasmanian Museum & Art Gallery cash		*70,000*	*70,000*		**70,000**
11.11 Tasmanian Museum & Art Gallery in kind		*80,000*	*80,000*		**80,000**
11.12 University of Adelaide cash		*30,000*	*30,000*		**30,000**
11.13 University of Adelaide in kind		*18,000*	*18,000*		**18,000**
11.14 Southern Cross University cash		*50,000*	*12,500*		**12,500**
11.15 Southern Cross University in kind		*145,000*	*38,000*		**38,000**
11.16 ABRS in kind		*321,000*	*321,000*		**321,000**
11.17 CSIRO External		*500,000*	*0*		**0**
Total Spend		**4,842,000**	**4,197,500**		**4,197,500**
Cash and in kind		***4,842,000***	***4,197,500***		**4,197,500**
NCRIS Spend		**0**	**0**		**0**
EIF Spend				**0**	**0**
ALL OUTPUTS					
Total Spend		**16,707,581**	**20,858,721**	**9,753,082**	**30,611,804**
Cash and in kind		***5,574,412***	***4,752,705***	***0***	**4,752,705**
NCRIS Spend		**2,622,247**	**3,929,358**	**0**	**3,929,358**
EIF Spend		**8,510,923**	**12,176,659**	**9,753,082**	**21,929,741**

3.3 Attachment 3 - Activities and Milestones for 2009-2010

Note: this section includes all components planned for ALA development in 2009-2011, including those to be funded from NCRIS funds and those to be funded from EIF funds.

3.3.1 Atlas of Living Australia Release Policy

In addition to a number of implementation, design and data quality principles the ALA Implementation Strategy proposed implementing the software as a series of progressively enhanced functional components sourced from their multiple providers against a release schedule using a controlled approach to maximise successful outcomes and minimise risk.

This release schedule is the heart of ALA release management policy:

3.3.2 ALA Release Schedule

Fourteen releases have been scheduled:

1	16 Dec 2009 (internal)	**Releases 1** and **2** are internal ALA project office releases, intended to bring together existing functionality and facilitate internal testing and integration.
2	17 Mar 2010 (internal)	
3	19 May 2010 (semi-public)	**Releases 3** and **4** will be semi-public releases accessible by partner agencies.
4	14 Jul 2010 (semi-public)	
5	15 Sep 2010 (public launch)	**Release 5** is be the first ***public release*** delivering core functionality to allow a user to answer 3 questions to the extent that data exists in the ALA at that time: What species are found in Australia? Where is a nominated species found in Australia? What species are found in a particular location/region of Australia?
6	17 Nov 2010	**Releases 6** through **9** are for public release of functions not included in release 5
7	16 Feb 2011	
8	20 Apr 2011	
9	15 Jun 2011	
10	17 Aug 2011 (all core functionality)	Full basic functionality is due to be in place by **Release 10**
11	12 Oct 2011	**Releases 11** through **13** are reserved for outstanding functionalities
12	14 Dec 2011	
13	14 Mar 2012	
14	16 May 2012 (bug fixes)	**Release 14** is for final bug fixes

3.3.3 Milestones

Milestones to 30 Jun 2010 are included for completeness and to re-baseline milestones provided in previous business plan.

No.	Milestone	Projected completion Date
Milestones to 30 Jun 2010		
1	Implementation of portal design	30 Jun 2010
2	Draft implementation of environmental data within portal	30 Jun 2010
3	Draft implementation of Spatial Analysis Toolkit within portal	30 Jun 2010

4	Prototype interfaces delivered (Data Dissemination)	30 Jun 2010
5	Interfaces for names information & databases operational	30 Jun 2010
6	ALA-SS EIF Milestone Report 3	30 Jun 2010
Milestones to 30 Sep 2010		
7	Spatial portal integrated into ALA	14 Jul 2010 (R4)
8	Evaluation release for ALA stakeholders	14 Jul 2010 (R4)
9	BHL mirror deployed	15 Sept 2010 (R5)
10	Spatial portal launched (including gazetteer and initial toolkit)	15 Sept 2010 (R5)
11	First public release of ALA components	15 Sept 2010 (R5)
12	Citizen science portal initial release launched	15 Sept 2010 (R5)
13	10/11 Management and Steering Committee Meeting 1	30 Sep 2010
14	Report on progress against activities proposed by ALA participants for 2009/2010	30 Sep 2010
15	ALA-SS EIF Annual Report 1 (including EIF Milestone Report 4)	30 Sep 2010
16	ALA NCRIS Progress Report 4	30 Sep 2010
Milestones to 31 Dec 2010		
17	Public release of extended function (Data Integration)	17 Nov 2010 (R6)
18	ALA workshops at TDWG conference	30 Nov 2010
19	Renewal of GBIF membership	31 Dec 2010
20	10/11 Management and Steering Committee Meeting 2	31 Dec 2010
21	ALA-SS EIF Milestone Report 5	31 Dec 2010
Milestones to 31 Mar 2011		
22	Pilot imaging projects under way	16 Feb 2011 (R7)
23	Morphbank mirror deployed	16 Feb 2011 (R7)
24	IdentifyLife feeding data into ALA	16 Feb 2011 (R7)
25	Existing checklist data sets integrated	16 Feb 2011 (R7)
26	Data linked to international name databases	16 Feb 2011 (R7)
27	Public release of extended function including Morphbank and demonstrators	16 Feb 2011 (R7)
28	High-function demonstrators presented (*Acacia*, fish)	16 Feb 2011 (R7)
29	10/11 Management and Steering Committee Meeting 3	31 Mar 2011
30	ALA-SS EIF Annual Business Plan 2 (including ALA EIF Milestone Report 6)	31 Mar 2011
Milestones to 30 Jun 2011		
31	Microbial data hub software deployed	20 Apr 2011 (R8)
32	Public release of extended function including microbial data	20 Apr 2011 (R8)
33	Public release of extended function (Data Integration)	15 Jun 2011 (R9)
34	10/11 Management and Steering Committee Meeting 4	30 Jun 2011
35	ALA-SS EIF Milestone Report 7	30 Jun 2011

Milestones to 30 Sep 2011		
36	AVH reengineered to exploit ALA services	17 Aug 2011 (R10)
37	OZCAM reengineered to exploit ALA services	17 Aug 2011 (R10)
38	BOLD mirror deployed	17 Aug 2011 (R10)
39	Species interaction data store feeding data into ALA	17 Aug 2011 (R10)
40	Spatial portal function complete	17 Aug 2011 (R10)
41	All project components released	17 Aug 2011 (R10)
42	Citizen science portal function complete	17 Aug 2011 (R10)
43	ALA-SS EIF Annual Report 2 (including EIF Milestone Report 8)	30 Sep 2011
44	ALA NCRIS Final Report	30 Sep 2011
Milestones to 31 Dec 2011		
45	ALA-SS EIF Milestone Report 9	31 Dec 2011
Milestones to 31 Mar 2012		
46	ALA-SS EIF Annual Business Plan 3 (including ALA EIF Milestone Report 10)	31 Mar 2012
47	Final integration for all groups of organisms	14 Mar 2012 (R13)
Milestones to 30 Jun 2012		
48	ALA-SS EIF Milestone Report 11	30 Jun 2012

3.4 Attachment 4 - Risk Management Strategy

This section updates the ALA Risk Management Strategy focussing particularly on the risks of particular relevance in 2010-2011. Changes and additions from the 2009-2010 Risk Management Strategy are in **bold**.

3.4.1 Specific risks

NCRIS Investment Plan 5.2.3 Risk/hazard Identification and Management Strategy		
Specific risks of particular relevance to the NCRIS Investment Plan in the 2010-11 period		
Area	**Specific risk/hazard**	**Management Strategy**
Informatics technology	Lack of the Informatics capacity and vision to create a world class version of the ALA.	**The management committees and project team will continue to proactively engage with colleagues in biodiversity informatics in 10/11.**
Recruitment	Inability to recruit staff with key skills, particularly in the biological informatics domain.	Part of the ALA Programme Manager's role is to ensure appropriate staff levels are built and maintained. **Staffing with bioinformaticians in the Mouse and Plant Phenomics areas continues to be problematic - in 2010/11 the ALA will work with APN and APPF to find appropriate solutions in these areas.**
Managing client/ stakeholder relationships	Clients/stakeholders not having ownership of outcomes leading to lack of uptake of outputs	**For 2010/11, the ALA will have a full-time Communications Manager who will take full responsibly for client/stakeholder relationships, use of social media, launch events etc.** **Use of part-time resources from the CSIRO Entomology Communications team will also continue.** **The ALA is also making use of a *User Centred Design* resource who is strongly engaging with a wide range of stakeholders in workshops concentrating on how users will interact with ALA systems.**
Project selection	Projects for creating tools or populating the ALA will need to be chosen to ensure meaningful outputs are achieved.	Governance and steering committees have been formed to make decisions on the projects to be included in the business plan. Project selection criteria will include feasibility and impact. **For 2010/11, individual projects will proceed with the endorsement of the ALA Management and Steering Committees.**
Technology failure	Failure of technology to provide products essential to the delivery of outputs in the appropriate electronic environment.	Monitoring of existing technology, and working in conjunction with technology suppliers to ensure that suitable platforms are chosen for project delivery. Working with technology suppliers and informatics specialists to guarantee, where possible, specific requirements that can be built into existing applications and products without needing large investment in programming costs. **For 2010/11, the ALA has obtained the services of an experienced Systems Administrator who will work with ARCS on these issues.**

3.4.2 General Project Management Risks

General Project Management Risks		
Area	**Specific risk/hazard**	**Management Strategy**
Resource management	Ineffective management resulting in slippage, non delivery, poor resource allocation.	Effective project management, with realistic budgeting, milestones and workforce planning. In order to manage the ALA-SS scope enhancements, the ALA has hired a Programme Manager as well as team leads where required. **For 2010/11, the ALA will have two additional project managers (one being the "Release Manager") to assist in mitigating this and other general project management risks.**
Quality standards	Outputs not meeting agreed standards will jeopardize uptake.	**For 2010/11, the ALA will have resources available for testing of systems before public release**
Performance management; project team communication	Disenfranchised unhappy staff, resulting in poor performance.	Clear and regular feedback. Performance agreements with clear, achievable objectives and appropriate training opportunities for staff at all levels. With ALA-SS funding, the number of contractors rather than staff will be increasing dramatically. Contractors are not under formal performance agreements so this risk will be managed directly by the ALA Programme Manager and team leads.
Managing team members in other institutions/ locations	Poor performance due to lack of communication, and proper controls to ensure delivery.	Established framework for communication between all project members, with certain line management duties relegated to appropriate staff in other institutions. **For 2010/11, formal reporting templates will be in use to further mitigate this risk**
Dependence on key staff	Loss of expertise essential to project delivery.	Succession planning for life of project; ensuring that at least 2 ALA staff have knowledge of all relationships and plans; internal project web site and document store to include briefing notes on all relationships and agreements.
Financial planning, control and reporting	Poor financial management can lead to cost overruns and insufficient budget for key tasks.	Good project management, with regular review of budgets and expenditure. **For 2010/11, the ALA has a resource who's main role is financial management**
Data loss/backup/ storage	Data loss jeopardises delivery.	Implement proper IT policy and procedures.
Obsolete technology	Poor equipment and software will affect outcomes and quality.	Sector knowledge and budget forecasting to ensure proper equipment and software.
Technology transfer (publishing knowledge, website)	Failure to deliver outputs in appropriate format can lead to failed outcomes.	Proper planning and monitoring to ensure outputs are to appropriate standards, which have been agreed between all parties.
Effective communication	Poor marketing of achievements would be detrimental to uptake of project results.	Appropriate communication strategy, developed through engagement with stakeholders. This can include press releases, product launches, and presentations at national and international conferences. **For 2010/11, the ALA's full-time Communications Manager will have responsibly for this area**

3.5 Attachment 5 - Acronyms

AAF	Australian Access Federation
ABCD	Access to Biological Collections Data
ABIF	Australian Biodiversity Information Facility
ABIN	Australian Biosecurity Intelligence Network
ABRS	Australian Biological Resources Study
ACL	Access Control List
ACPFG	Australian Centre for Plant Functional Genomics
AFD	Australian Faunal Directory
AIMS	Australian Institute of Marine Science
ALA	Atlas of Living Australia
ALA MC	Atlas of Living Australia Management Committee
AM	Australian Museum
AMANI	Australian Marine Algal Name Index
AMRiN	Australian Microbial Resources Information Network
AMRRN	Australian Microbial Resources Research Network
ANBG	Australian National Botanic Gardens
ANDS	Australian National Data Service
ANHAT	Australian Natural Heritage Assessment Tool
ANU	Australian National University
APC	Australian Plant Census
APF	Australian Phenomics Facility
APN	Australian Phenomics Network
APNI	Australian Plant Name Index
APPD	Australian Plant Pest Database
APPF	Australian Plant Phenomics Facility
AQIS	Australian Quarantine and Inspection Service
ARCS	Australian Research Collaboration Service
AVH	Australia's Virtual Herbarium
BA	Birds Australia
BHL	Biodiversity Heritage Library
BOLD	Barcode of Life Database
CAMD	Council of Australian Museum Directors
CBIT	Centre for Biological Information Technology
CERF	Commonwealth Environmental Research Facilities
CHACM	Council of Heads of Australian Collections of Microorganisms
CHAEC	Council of Heads of Australian Entomological Collections
CHAFC	Council of Heads of Australian Faunal Collections
CHAH	Council of Heads of Australasian Herbaria
CITES	Convention on International Trade in Endangered Species
CMS	Content Management System
CoL	Catalogue of Life
CSIRO	Commonwealth Scientific, Industrial and Research Organisation
CSIRO ICT	CSIRO Information and Communication Technologies
CSIRO IM&T	CSIRO Information Management & Technology
CSV	Comma Separated Value
DAFF	Department of Agriculture, Fisheries and Forestry
DELTA	DEscription Language for TAxonomy
DEWHA	Department of the Environment, Water, Heritage and the Arts

DIAS-B	Data Integration and Annotation Services for Biodiversity
DIISR	Department of Innovation, Industry, Science and Research
EFT	Equivalent Full Time
EIF	Education Infrastructure Fund
EoL	Encyclopaedia of Life
ERIN	Environmental Resources Information Network
eSIM	eScience Information Management
FTE	Full-time Equivalent
FTP	File Transfer Protocol
GBIF	Global Biodiversity Information Facility
GIS	Geographic Information System
GPS	Global Positioning System
GUID	Globally Unique Identifier
HTML	HyperText Markup Language
IBS	Integrated Biological Systems
IF	Index Fungorum
IMOS	Integrated Marine Observing System
IPNI	International Plant Name Index
IP	Intellectual Property
IPR	Intellectual Property Rights
IRMNG	Interim Register of Marine and Non-marine Genera
IPT	Integrated Publishing Toolkit
KML	Keyhole Markup Language
LSID	Life Science Identifier
LTER	Long Term Ecological Research
MAGNT	Museum and Art Gallery of the Northern Territory
MDBC	Murray-Darling Basin Commission
MoC	Memorandum of Cooperation
NATA	National Association of Testing Authorities
NCRIS	National Collaborative Research Infrastructure Strategy
NeAT	National eResearch Architecture Taskforce
NGOs	Non-government Organisations
NRS	National Reserve System
NSF	National Science Foundation
OAI-PMH	Open Access Initiative Protocol for Metadata Harvesting
OBIS	Ocean Biogeographic Information System
OBO	Open Biomedical Ontologies
OCR	Optical Character Recognition
OECD	Organisation for Economic Co-operation and Development
OGC	Open GIS Consortium
OWL	Web Ontology Language
OZCAM	Online Zoological Collections of Australian Museums
PaDIL	Pests and Diseases Image Library
PBI	Planetary Biodiversity Inventory
PDA	Personal Digital Assistant
PDFs	Portable Document Format
PfC	Platforms for Collaboration
PKI	Public Key Infrastructure
PODD	Phenomics Ontology-Driven Database
QM	Queensland Museum
RDF	Resource Description Framework

REST	Representational state transfer
RFID	Radio-frequency identification
SAM	South Australian Museum
SDD	Structured Descriptive Data
SEM	Scanning Electron Microscope
SOAP	Simple Object Access Protocol
SOP	Standard Operating Procedure
TAPIR	TDWG Access Protocol for Information Retrieval
TCS	Taxon Concept Schema
TDWG	Taxonomic Databases Working Group
TERN	Terrestrial Ecosystem Research Network
TMAG	Tasmanian Museum and Art Gallery
TRIN	Taxonomic Research Information Network
uBio	Universal Biological Indexer and Organizer
UQ	University of Queensland
UQ CBIT	UQ Centre for Biological Information Technology
UQ ITEE	UQ School of Information Technology & Electrical Engineering
URL	Uniform Resource Locator
WAM	Western Australian Museum
WCS	Web Coverage Service
WFCC	World Federation for Culture Collections
WFS	Web Feature Service
WMS	Web Map Service
WoRMS	World Register of Marine Species
XMP	Extensible Metadata Platform

3.6 Attachment 6 - Details of participant contributions by organisation 2010-2011

3.6.1. CSIRO Contributions to ALA 2010-2011

The in-kind contributions in the following table include overheads for salaries for the ALA Director and Executive Officer and for line management costs. The figure presented is the sum committed as part of the original ALA Funding Agreement, and is lower than the projection included in ***3.2.1 Revised budget 2009-2012*** ($832,412 in total). The latter figure is an estimate of the actual in-kind costs expected to be incurred in the period.

Owing to the fact that the ALA started work a year later than the date projected in the original funding agreement, the planned CSIRO cash contributions were not made in 2006-2007. The ALA is in discussion with CSIRO about compensatory cash or in-kind contributions to ensure that the CSIRO contributions across the whole of project match the original projections.

Participant	Contributions	Projected $	Reported $
CSIRO	Cash	500,000	
	Cash (CERF)	0	
	In-kind	737,698	
	Total	***1,237,698***	

Project Title – Australian Mangrove and Saltmarsh Species (ANH)

Description	The aim of this collaborative project is to demonstrate species level content for projects such as the Atlas of Living Australia and for research, education and public information. It will build on existing biodiversity information management activities, resources and expertise around the nation and beyond. Information on the plant and animal species found in Australian mangroves and saltmarsh will be collated, with emphasis on taxonomy, appearance, identification, biology, distribution and ecology. The project will focus on developing active and inclusive partnerships to provide freely available on-line access to information using current biodiversity information management technologies. This particular project is being planned to be the nucleus of a larger and self sustaining national project documenting the species of Australian mangrove and saltmarsh communities and to act as a model for possible future initiatives in other Australian ecosystems. Links will be developed with mangrove and saltmarsh researchers, experts and other collections and institutions to facilitate the development of species lists and profiles for plant and animal taxa occurring in Australian mangrove and saltmarsh habitats. The approach is to begin with the obligate core mangrove and saltmarsh species in order to develop the collaborations, methodologies and technology, and the content format. As the information builds and the system is established, the project will expand to incorporate the facultative, transient and marginal species of the mangrove and saltmarsh community.
Contact(s)	Emma Clifton, Brendan Lepschi
Taxa or biome	Australian Mangrove and Saltmarsh Species
Deliverables	Liaise with other collections, institutions and experts. For areas of interest and expertise: • Seek species lists of organisms occurring in mangrove and saltmarsh communities (flag high, medium, low fidelity) • Compile / contribute information to species profiles • Compile distributional information • Identify associations and co-evolutionary relationships • Source images, multimedia and other relevant information Source additional support and funding to assist with obtaining species information, images, multimedia and expanding the network of mangrove and salt marsh experts. Continue compiling and refining species lists – continue to focus on Medium and Low Fidelity plant species and High fidelity groups of other organisms. Complete species profiles for all non-arborescent high fidelity plant species. Check CANB specimens for medium and non-arborescent high fidelity plant species. Verify current taxonomy in APNI/APC. Ensure determinations and geocodes are accurate and all specimens fully databased. Continue to source contributions of species lists, species profiles, information on associations and co-

evolutionary relationships and images, multimedia and related data from other collections and institutions.

Cost Salary CSOF 3.3 ½ time for 2.5 months to 13th September 2010.

Staffing Staff available to undertake the plant aspects of the project

Staff available to oversee project, working space and equipment (PC terminal) available.

Risks Risks include:

- A lack of or limited data for some species descriptions
- Availability of suitable images for all taxa
- Lack of contributions from other CSIRO collections to include organisms other than plants
- Inability to engage national mangrove community biologists

A significant challenge for this project is to persuade others to voluntarily contribute their data, information, time and expertise. Experts that are self-employed or employed by other institutions are fully occupied with their own or institutional priorities. Their capacity to contribute to this project may be limited. The project staff will need to be very persuasive and to develop appropriate incentives to secure the necessary cooperation.

ALA linkages This project will provide species level content on a specific biome to the ALA.

Other linkages This project will link directly to data from the Australian Plant Name Index (APNI), Australia's Virtual Herbarium (AVH) and the Australian Plant Image Index (APII).

Data access Data from this project will be provided to the ALA and other biodiversity information projects using web services and the standards and protocols of TDWG and GBIF as outlined on the ALA website.

Users This project will provide information for research, education and public information. It will collate data from current literature and available on-line resources, providing a convenient and up-to-date source of information for Australian mangrove and saltmarsh plant species. The species profiles and electronic key produced for this project will be of interest to local, state and federal government departments, researchers and organisations such as Landcare, Coast Care and Greening Australia as well as the general public.

Project Title –Family Level Classification for Australian vascular plants (ANH)

Description Provision of an agreed family-level classification for Australian vascular plants (including ferns) for the *Australian Plant Census* project. Currently the APC uses Cronquists' 1981 family classification (that adopted by the *Flora of Australia*), a system now widely acknowledged as having been superseded. This project will provide an agreed family-level classification for Australian vascular plants, using the most recent APG classification as a starting point, with additional taxonomic ranks (e.g. order to kingdom) also included. Synonymies and constituent taxa will be provided for families and all higher ranks.

Contact(s) Brendan Lepschi, Anna Monro

Taxa or biome Australian vascular plants

Deliverables An agreed higher-level (family to kingdom) classification for Australian vascular plants (including ferns), available electronically via the APC website, and including all relevant synonymy and protologue information. Selected important alternative family-level classifications will also be captured and entered into APNI, and will be available via the APC or APNI interfaces. All agreed concepts are dynamic and flexible, endorsed by CHAH, and will be revised and amended via the APC Working Group consensus model as new data is published.

Program for 2010-2011 is as follows:

- Agreed higher-level (i.e. order to kingdom) classifications endorsed by CHAH (by end March 2010)
- Data entry of higher-level classification into APNI (approximately 1000 names, including constituent families[1])
- APNI data entry of additional higher-level classifications (e.g. remainder of Kubitzki series, Thorne), including protologues and relevant synonymies. This is a lower-priority component and will be undertaken as time allows. Completion of data entry of the Kubitzki series is the highest priority.
- Compilation and presentation to APC working group of newly published data on family and/or higher-level classification for Australian vascular plants (dependent on the rate of publication of new data). Any resultant changes to existing agreed classifications endorsed by CHAH within two weeks of agreement by APC WG.
- APNI data entry of new data (capture stage, within one month of publication) and modifications as a result of APC process (within two weeks of CHAH-level approval).

[1] Constituent families are already entered into APNI, but need to be linked to agreed family-level classification concepts. Previous calculation of total number of names (for 2009-2010) did not include constituent family names.

Cost	Salary – CSOF 3.5
Staffing	Staff available to oversee project, working space and equipment (PC terminal) available. Staff available to manage and disseminate data deliverables derived from this work Staff available to undertake the project
Risks	Database unavailable (low)
ALA linkages	Data available to other ALA participant activities (e.g. *Australia's Virtual Herbarium* (AVH), other specific ALA projects) immediately.
Other linkages	Automatic linkage of data between APNI and APC, as well as other databases such as the *Australian Plant Image Index* (APII). Data available to DEWHA applications (ERIN, SPRAT, etc.) Data available to AVH and on-line national, state and territory floras.
Data access	Access to data is the same as that for other elements of the ANBG's IBIS databases (e.g. the *Australia's Virtual Herbarium,* the *Australian Plant Name Index* and the *Australian Plant Image Index*) and follows the web service guidelines provided by the ALA and the international biodiversity information standards and protocols of GBIF and TDWG.
Users	Both the APNI and APC have significant numbers of users, both nationally and internationally, with approximately 6000 hits per week. Users include all State and Territory herbaria, overseas herbaria, ABRS, DEWHA and other government departments, NGOs (e.g. Greening Australia) and the general public. Users access APNI and (particularly) APC to obtain nomenclatural and taxonomic information on the Australian vascular flora, including recommended (nationally agreed) scientific names. APNI and APC also provide the nomenclatural framework for the AVH. The number of potential users of this data can be expected to grow as more data is added and the product is refined and developed.

Project Title: ANIC Digital Content Management and Delivery (ANIC)

Description	ANIC is spending resources specifically for the compilation, delivering and managing digital content. This includes databasing (and the management of database records), compiling a digital image library with appropriate metadata (some of these images gathered from previous ALA funding), and various taxonomic or diagnostic products. Resources that will be delivered to the ALA through this project include: - Image libraries of type specimens of Australian Lepidoptera - Habitus images of insect families - Converting the ANIC image library from photographic slides to digital format and adding metadata - Adding to our database record holdings, particularly in dung beetles and ants. - Coordination of activities that include the production of digital content for the ALA.
Contact(s)	John La Salle
Taxa or biome	Australian Insects (plus others as appropriate from other CSIRO collections)
Deliverables	A range of high quality digital records and information, including database records, images, taxonomic products to be made available to ALA at appropriate standards.
Cost	Salary $169,269 (including overheads). A full time person is being put to this project, whose activities include production of original digital content, managing metadata for content and coordination. Several other staff members are involved in the production of digital content.
Staffing	We will use an existing staff member with considerable experience in this area.
Risks	Database unavailable (low)
ALA linkages	This person would be available to offer assistance/advice to other ALA projects delivering digital data. This need not be confined to CSIRO based projects.
Other linkages	This is a capability position. It links to all ANIC projects which deliver digital data, and could link to any other projects as well.
Data access	This person will be put in place specifically to ensure that the data is shared at the appropriate standards, protocols, etc.
Users	Users of the ALA/digital data.

Project Title – Digitally Preserving Type Specimens of Australian Birds (ANWC)

Description

Digitally Preserving Type Specimens of Australian Birds

Australia's bird fauna is renowned not only for its beauty but also for the scientific significance it holds in understanding the history of evolution of the world's birds. The type specimens that are the anchor reference points to most Australian bird names are mostly held in natural history collections in overseas museums. A significant proportion, nonetheless, are held in Australian museums. Furthermore, Australian museum collections understandably enough hold the best and most complete series of specimens that are available though this does not necessarily equate with "completeness" per se. The goals of this proposal are to enhance the availability of type specimens, which by a long standing convention in museums are not available for loan, and to use as test cases a select group of birds from the collection of the Australian National Wildlife Collection to test the utility of digitizing a collection of all specimens of a family. The information resources needed to accurately identify species are scattered and largely inaccessible to the general community, environmental managers and wildlife consultants. Printed field guides fail to adequately portray either the diagnostic features or the intrinsic beauty of these animals, and traditional dichotomous keys are largely ineffective for purposes of identification.

Contact(s)

Leo Joseph, ANWC

Taxa or biome

All type specimens of birds held in the Australian National Wildlife Collection (ANWC); type specimens of birds held in other Australian museums; all specimens of quail-thrush *Cinclosoma* spp in the ANWC

Deliverables

1). Basic web-page with dorsal, ventral and lateral images of Australian bird type specimens and images of each *Cinclosoma* specimen in ANWC; 2) metadata such as identification, location, photographer and scan of original publication of each name associated with the type specimens

Cost

Lab technician at CSOF3 for 6 months to capture and assemble images, catalogue image files, scan literature sources, and populate LUCID database. $75,400 (incl. on costs).

Travel to other Australian institutions for photography of type specimens: $3500.

Equipment: $2500.

TOTAL: $80,000

Staffing

ANWC staff are available to assist with establishing database (Cawsey), to verify identification of the images (Joseph).

Risks

Majority of specimens held at ANWC so no issues of access. Other Australian museums very likely to allow access.

ALA linkages

These images will be used in the taxon pages for their representative taxa (family, genus, species) and can be used in many other contexts, such as illustrating typical animals of individual bioregions.

Other linkages

A similar project has been done already at the Academy of Natural Sciences, Philadelphia where Leo Joseph, now at ANWC, led a project to digitally image type specimens of Australian birds from John Gould's collection held there. This project could eventually be linked with that one and used as leverage to establish access to type specimens held in other overseas institutions.

Data access

A temporary ANWC data store will be created for all of the image files and databases. We require guidance from ALA regarding longer term curation of the digital data.

Users

Birds are a vertebrate group that persist in most Australian bioregions and are commonly assessed by students, land managers, conservation planners, and environmental consultants. All require better means to make accurate identifications. The wider community has growing interest in these groups and this interest will be further stimulated by access to high quality information and images.

Project Title – Remote Monitoring of Australia's Bat Fauna (ANWC)

Description

Developing web-based resources to assist remote monitoring of Australia's bat fauna

Australia has a diverse insectivorous bat fauna of exceptional conservation and ecological significance. Insectivorous bats are often abundant and play an important ecological role as predators on diverse insect groups. At least a third of the mammals recorded or expected on a typical field survey are bats. All insectivorous bats emit ultrasonic echolocation calls that they use for navigation and hunting, and the call structure and frequency of each species is, with few exceptions, unique and diagnostic. While many species are hard to capture, mature technologies are available for survey using automated recording of echolocation calls. In Australia, the most widely used system is the locally developed and supported AnaBat. Acoustic surveys using AnaBat are the most prevalent method for assessing bat diversity in environmental impact assessments and monitoring projects. As an example, the growth of AnaBat usage in the last 5 years in Western Australian by environmental consultants has meant that bats are now sampled on most field surveys, whereas it was uncommon to consider bats in much detail prior to 2004. To date, reference echolocation calls – essential for accurate identifications – have been maintained by private individuals or government departments and there is no centralised library of such resources. We propose to develop a web-based system that allows reference (vouchered) and representative (non-vouchered capture and release) calls of insectivorous bats to be lodged, accessed and used in appropriate ways. The latter objective will be achieved by developing instructional and support resources that will assist users with varying levels of expertise to access this highly significant technology.

Contact(s)

Ken Aplin and Leo Joseph, ANWC

Taxa or biome

Australian insectivorous bats

Deliverables

1). Development of database structures for storage of calls and for metadata; 2) Basic web-page for each of the c. 75 species of Australian insectivorous bats with distribution map coded for IBRA, bioregions; 3). Reference calls for a selection of Australian bats, derived from the private resources of Dr Kyle Armstrong and fellow colleagues in the Australasian Bat Society, Inc; 4) Instructional and support resources that explain the basic biology of echolocation calls, and a set of guidelines for their effective collection; 5). Development of protocols and quality guidelines for database access at various levels (e.g. user, contributer, verifier).

Cost

Scientist (Dr Kyle Armstrong) employed at CSOF5 for 4 months to produce the deliverables: $76,000.

Consumables and travel: $2000 + $2000

TOTAL $80000

Staffing

Dr Kyle Armstrong (currently employed by Uni Adelaide under CERF (TRIN) funding), through his consultancy business and institutionally supported research, has a high level of expertise with use of AnaBat and other echolocation call analysis systems and their application in various kinds of survey and monitoring contexts. In addition to specialist technical skills, he has an excellent understanding of the perspectives of consultants, regulators and researchers.

ANWC staff (Cawsey and Aplin) will assist with developing database structures and with development of the instructional and support resources (Aplin).

Risks

Once open for public access the success of the system will depend to some extent on willingness of other bat researchers to contribute reference call files. Though some consultants may choose not to contribute, the majority of researchers and users of AnaBat are likely to see the benefits of sharing this information as the resource grows. There has been an attempt at developing a centralised call library in the past, but it did not achieve critical mass, possibly because of issues with timing and its promotion. There are now many more users of AnaBat (and other systems), so there is likely to be more interest, but the issue of private ownership of data will need to be addressed carefully.

ALA linkages

The taxon pages can be accessed more widely as ALA content and enriched through future related projects.

Other linkages

The system will include extensive links to other technical and interpretative websites concerned with insectivorous bat biology and echolocation.

Data access

A temporary ANWC data store will be created for all of the echolocation call files and databases. We require guidance from ALA regarding longer term curation of the digital data.

Users

The resource will be used by federal and state government wildlife researchers, academics, private environmental consultants, private sector environmental managers.

Description	**Australian Fish Atlas – an interactive distribution and identification tool** The Fish Biogeography and Taxonomy group are proposing to produce an interactive Fish Atlas for the ALA to showcase potential application of the broader Research Infrastructure Projects underway. Under the proposed project, existing electronic resources held by CSIRO Marine and Atmospheric Research (CMAR) will be further developed and expanded to produce an online, interactive, geographic distribution and visual identification tool. Leveraging on web technologies being developed within the ALA and data held by the Australian National Fish Collection (ANFC), including current scientific and standard vernacular names, images, descriptions, distributions and habitat preferences of fishes in the Australian region, the interactive search tool will make presently unavailable data publicly accessible via a single user interface for the first time. The ANFC allocation for 2010/11 will be used to further expand the PIAF library through the archiving, digitisation and enhancement of new primary images for use in the proposed project outlined above, as well as archiving part of a degrading historical secondary collection of fish images.
Contact(s)	Alastair Graham: 03 62325351, alastair.graham@csiro.au
Taxa or biome	Australian marine fishes
Deliverables	ANFC's Photographic Index of Australian Fishes (PIAF) has been compiled over more than 30 years of ichthyological research. Staff continue to expand this database (already the most comprehensive collection of images of Australian fishes), with the end-goal of depicting every species of Australian fish. The resource is used extensively for species identification, and for the illustration of taxonomic publications, websites and identification books for industry and the public. The expansion of PIAF as a resource will continue during 2010/11 with the capture of additional (digital) images, and the selective archiving and enhancement of the existing primary photographic slide collection. The development of a Fish Atlas as outlined earlier is contingent on the allocation of funds from within the ALA and co-contribution from CSIRO. If the additional project is undertaken, enhanced PIAF images with validated identifications will be incorporated directly into the Atlas.
Cost	The ANFC's allocation ($80,000) will contribute to the continuation of obtaining, archiving and enhancing images for PIAF. This work will primarily be undertaken by ANFC staff member Louise Conboy (CSOF 4) as additional time allocation.
Staffing	Staff, computer equipment and digital imaging resources are already available to undertake the project.
Risks	It is intended that PIAF images will eventually be made available to a Fish Atlas; the timing of this outcome is dependant on funding.
ALA linkages	As discussed above, it is intended that PIAF images will contribute to a demonstration project showcasing potential applications of the broader Research Infrastructure Projects underway in partnership with the ALA.
Other linkages	Images from the PIAF database have been used in a number of books, guides, taxonomic papers and websites, including CAAB. In addition to PIAF, the ANFC also houses one of the most important, and largest, collections of Southern Hemisphere fishes and tissues in the world with the most diverse coverage for marine fishes and is particularly strong for sharks and rays. The majority of tissues have been collected from registered and curated specimens, many of which have been photographed for inclusion in PIAF.
Data access	Metadata for specimens, tissues and images can be accessed from the ANFC for scientific purposes (subject to commercial-in-confidence, and other standard restrictions).
Users	Images, tissues and specimens have been utilised in the creation of numerous outputs for industry, public and researchers, including: species descriptions, guidebooks, FISH-BOL and websites.

3.6.2. Australian Museum contribution to ALA 2010/11

Participant	Contributions	Projected $	Reported $
Australian Museum	Cash	100,000	
	In-kind	400,000	
	Total	***500,000***	

Project Title: Marine and Terrestrial specimen data capture

Description	Marine and Terrestrial specimen data capture
Contact(s)	Dr Penny Berents (Head of Natural Science Collections) penny.berents@austmus.gov.au
Taxa or biome	Australian land & freshwater snails; Australian Arachnids and Myriapods; NSW Marine Fishes; Australian Lepidoptera (various moth families associated with BushBlitz survey projects); Australian nepomorph water bugs; Various insect taxa submitted to BOLD from the Townsville region; Australian Mammals including Grey Kangaroo and Swamp Wallabies; Australian Birds; Australian Polychaetes, Echinoderms, Crustacea; Australian reptiles and amphibians.
Deliverables	Approximately 25,000 records
Cost	2.7 FTE Technical Officers = approx $185000
Staffing	20% of 12 Technical Officers time, computers, database and collections already available
Risks	None. Staff, equipment and collections available and AM has given priority to the project for 2010-11.
ALA linkages	Data will be available through OZCAM portal and will complement data provided by other natural history museums.
Other linkages	Data available to OZCAM, GBIF, OBIS
Data access	Data will be made available through the OZCAM portal
Users	Scientists, natural resource managers, government agencies (eg. DEWHA, DECC, AQIS, DAFF), special interest groups and other users of biodiversity information

3.6.3. Museum Victoria contribution to ALA 2010-2011

Participant	Contributions	Projected $	Reported $
Museum Victoria	Cash	100,000	
	In-kind	850,000	
	Total	***950,000***	

Project Title: PaDIL projects

Description	PaDIL projects – Pests and Diseases Image Library
Contact(s)	Ken Walker
Taxa or biome	Biosecurity Invertebrates
Deliverables	New PaDIL developments and subprojects
Cost	Staff costs 1.0 FTE = approx. $100,000
Staffing	Equipment and database already available
Risks	None projected as funding provided until Dec 2010
ALA linkages	Biosecurity Portal
Other linkages	IPPC, SPHDS, OCPPO, Bugwood Network, Forest Images.org
Data access	All images and data available through PaDIL
Users	Rapid species level identification or confirmation through ability to view the biosecurity specimens online.

Project Title: MV Science Collections online

Description	Sciences Collection online web readiness
Contact(s)	Mark Norman
Taxa or biome	Victorian fauna
Deliverables	Up to 2,000 species pages as basis of Natural Science collection of Museum Victoria going online.
Cost	$40K secured, $50K requested from MV 10/11 budget. Staff costs 1.0 FTE = approx. $90,000
Staffing	Staff, equipment and database already available
Risks	None projected as funding secured until Dec 2010 and requested to June 2011
ALA linkages	EMu database feeds to be available to Ozcam and ALA
Other linkages	Ozcam, DSE/MV Mobile Learning project, DSE/MV Wild Exhibition Biodiversity project
Data access	All images and data to be available from MV Sciences Collections Online (active early 2011)
Users	Rapid species level information and images for key Victorian fauna and wider MV faunal collections

Project Title: Collections registration

Description	MV Natural Sciences Collections registration (specimens and tissue bank)
Contact(s)	Mark Norman
Taxa or biome	Museum Victoria faunal collections
Deliverables	Entomology collections data clean up 14,000 tissue samples to be registered through collaboration with Australian National Wildlife Collections, Canberra
Cost	$60K confirmed, $120K requested for 2010/2011.
Staffing	Staff, equipment and database already available
Risks	None projected as funding secured until Dec 2010 and requested to June 2011
ALA linkages	EMu database feeds to be available to Ozcam and ALA
Other linkages	Ozcam, GBIF, EOL

Data access	All images and data to be available from MV Sciences Collections Online (active early 2011)
Users	Rapid species level information and images for key Victorian fauna and wider MV faunal collections. Specimen data and species distributions available to diverse users.

Project Title: Fishes of Australia online

Description	Online representation of national fish fauna
Contact(s)	Martin Gomon/Di Bray
Taxa or biome	Australian marine and freshwater fish species
Deliverables	Species and higher level data and imagery for 800+ species
Cost	Staff costs 0.2 FTE for curatorial and collection management staff (2) = $40,000
Staffing	Staff, equipment and database already available
Risks	None projected
ALA linkages	ALA to link directly to website
Other linkages	AFD
Data access	All images and data available through Fishes of Australia online
Users	Rapid species level information and images, plus an interactive key to Australian freshwater fishes and keys to other groups. Aimed at diverse user groups.

3.6.4. Queensland Museum contribution to ALA 2010-2011

Participant	Contributions	Projected $	Reported $
Queensland Museum	Cash	25,900	
	In-kind	190,855	
	Total	***216,755***	

Project Title: Data capture and delivery

Description	Digital capture and delivery of biological, palaeontological and geological collection data, images and phenotypic data related to the permanent collections of the Queensland Museum
Contact(s)	Dr John Hooper (collections and research products), Ms Cecelia Ryan & Mr Paul Avern (database infrastructure, data digitisation and dissemination) john.hooper@qm.qld.gov.au, cecelia.ryan@qm.qld.gov.au, paul.avern@qm.qld.gov.au
Taxa or biome	All zoological taxa (living & fossil), fossil plants & mineralogical specimens
Deliverables	Staged delivery of (currently) approx. 800,000 datapoints and associated data to the ALA via OZCAM. [The exact number of final records that will be delivered is still uncertain due to these data containing a mixture of point-data ranging from individual specimens of single taxa from a single locality to multiple specimens of multiple taxa (specimen lots) from single localities].
Cost	Approximately $500,000 over 5 years (cash expenditure on implementation of Vernon CMS), and $390,000 (in kind contribution, such as salaries, overheads, IT infrastructure, towards ongoing data capture and verification by curatorial, collection management and IM/IT staff) Note: These financial targets (cash expenditure and in kind contribution) were met by the end of the 07/08 financial year.
Staffing	IM/IT have 1.5 FTE staff responsible for the collection database development and management and liaising with scientific and technical staff. Biodiversity & Geosciences Programs have approximately 10 FTE staff whose duty is (partially) to continue digital capture of collection data, and to verify accuracy of this data on an ongoing basis.
Risks	Data quality variable amongst collections due to e.g. age of collections, accuracy of locality data, the taxonomic hierarchy used, taxonomic authority of identification etc. Phenotypic data exists for some but not all phyla, and availability dependent on concurrent projects and funding to assemble species descriptions (e.g. Barcoding of Life project funding to QM from Alfred P. Sloan Foundation for some marine collections)
ALA linkages	Data contribute to ALA
Other linkages	OZCAM; Barcoding of Life (Census of Life/ Census of Marine Life), Environment Australia (e.g. ANHAT) data sets
Data access	Data conforms to Darwin Core, and access by ALA will be guided by protocols developed by OZCAM. QM will have its own public access portal and web tools but contribution of particular datasets to ALA will require guidance from and development of appropriated software (e.g. wrappers) by ALA
Users	Internal QM users for collection management, specimen loans and tracking, GIS, ecological modelling, inventories for EIS, etc. Direct public access to QM data aimed at local communities and groups (e.g. schools) for inventories, mapping of local biotic communities, illustration of type specimen holdings, etc. Scientific users would probably use the OZCAM/ ALA portal for GIS, Bioclim modelling etc

3.6.5. Tasmanian Museum and Art Gallery contribution to ALA 2010-2011

Participant	Contributions	Projected $	Reported $
Tasmanian Museum and Art Gallery	Cash	70,000	
	In-kind	80,000	
	Total	***150,000***	

Project Title:

Description	
Contact(s)	
Taxa or biome	
Deliverables	
Cost	
Staffing	
Risks	
ALA linkages	
Other linkages	
Data access	
Users	

3.6.6. University of Adelaide contribution to ALA 2010-2011

Participant	Contributions	Projected $	Reported $
University of Adelaide	Cash	30,000	
	In-kind	18,000	
	Total	***48,000***	

Project Title:

Description	Interactive Lucid Key to Terrestrial Invertebrates
Contact(s)	John Jennings & Andy Austin (UofA), Mark Harvey (WAM)
Taxa or biome	All terrestrial invertebrate groups
Deliverables	Interactive Lucid Key
Cost	~ $25k. Note: overall cost (including previous and co-funding) in excess of $150,000
Staffing	Staff available in WA Museum and University of Adelaide, and via subcontracting, for imaging, key construction, and testing, and writing text boxes. We have employed Dr Claire Stevens on a casual basis to provide check boxes and will employ a casual person to complete automontage images.
Risks	
ALA linkages	Key will be publically available through CBIT in the first instance
Other linkages	
Data access	See above
Users	Students, biodiversity workers, researchers

Project Title: Databasing of Hymenoptera

Description	Databasing of Australian (Hymenoptera). This is part of a long-term goal to provide to the entire described Australian wasp and sawfly fauna to the Australian Faunal Directory. See Australian Faunal Directory website for missing groups.
Contact(s)	John Jennings & Andy Austin
Taxa or biome	All Hymenoptera excluding ants and bees.
Deliverables	The database(s) will be downloaded to the Australian Faunal Directory
Cost	~ $10k
Staffing	Staff available to undertake databasing and final product delivery
Risks	Very low
ALA linkages	Database also available to other ALA participants and will be entirely on-line
Other linkages	Also links in with GBIF
Data access	Data will be on-line through Australian Faunal Directory
Users	Potential users include State and Territory agencies, overseas researchers, ABRS, and other government departments and the general public who are interested in systematics of the superfamily.

3.6.7. Southern Cross University contribution to ALA 2010-2011

Participant	Contributions	Projected $	Reported $
Southern Cross University	Cash	12,500	
	In-kind	38,000	
	Total	***50,500***	

Project Title: Australian Plant DNA bank

Description	Australian Plant DNA Bank
Contact(s)	Prof Robert Henry, Nicole Rice
Taxa or biome	The continued focus for 2010-2011 is to build the depth of plant families in the collection. In addition the Australian Plant DNA Bank will hold the DNA reference samples for numerous whole genome sequencing projects including wheat, sugarcane, Australian Oryza species and taxa from the Eucalypts.
Deliverables	Genomic DNA samples and associated data for distribution including DNA quantity and quality.
Cost	
Staffing	1 x 60%, 1 x 40% and 1 x 60%
Risks	
ALA linkages	Australian Herbaria and botanic gardens. Particularly important that the DNA samples link to a vouchered Herbarium specimen.
Other linkages	Linkages to genetic resource collections, other DNA banks, herbaria and botanic gardens. Current linkages include collaborative projects, for example the collection of Australian species of Oryza with Japanese colleagues and Australian Tropical Herbarium. International plant genome sequencing projects include efforts in sugarcane, wheat, coffee and almond.
Data access	Through Intersect plans are in place to integrate the database of the Australian Plant DNA Bank with the Atlas of Living Australia portal during 2010-2011. This will then allow the DNA collection and associated information to me available through the one portal. The data will also be available online at www.dnabank.com.au. Additional data available on request of DNA samples.
Users	Molecular biologists

3.6.8. Australia's Virtual Herbarium contribution to ALA 2010-2011*

Participant	Contributions	Projected $	Reported $
Southern Cross University	Cash		
	In-kind	1,000,000	
	Total	***1,000,000***	

* Note: As no cash contribution, project details were not required.

3.6.9. Australian Biological Resources Study contribution to ALA 2010-2011*

Participant	Contributions	Projected $	Reported $
Southern Cross University	Cash		
	In-kind	321,000	
	Total	***321,000***	

* Note: As no cash contribution, project details were not required.

3.6.10. Australian Plant Pest database contribution to ALA 2009-2010*

Participant	Contributions	Projected $	Reported $
DAFF/ APPD	Cash	0	
	In-kind	0	
	Total	***0***	

* Note: As no cash contribution, project details were not required.