www.ala.org.au

Atlas of Living Australia

Infrastructure for Biodiversity Research

Donald Hobern

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Melbourne Museum, 28 July 2010

The Atlas is funded by the Australian Government under the National Collaborative Research Infrastructure Strategy and further supported by the Super Science Initiative of the Education Investment Fund

Atlas of Living Australia

- Australian Government funding to June 2012
  - NCRIS 2006-2011: $8.2M
  - EIF Super Science 2009-2012: $30.0M
  - ALA partner in-kind contributions: $26.5

- Mission
  - To develop an authoritative, freely accessible, distributed and federated biodiversity data management system

ALA Participants

- **Government:**
  - CSIRO
  - Department of the Environment, Water, Heritage and the Arts
  - Department of Agriculture, Fisheries and Forestry
- **Representative bodies:**
  - Council of Heads of Australasian Herbaria
  - Council of Heads of Australian Faunal Collections
  - Council of Heads of Australian Entomological Collections
  - Council of Heads of Australian Collections of Microorganisms
  - Council of Australasian Museum Directors
- **State museums:**
  - Australian Museum
  - Museum and Art Gallery of the Northern Territory
  - Museum Victoria
  - Queensland Museum
  - South Australian Museum
  - Tasmanian Museum and Art Gallery
  - Western Australian Museum
- **Universities:**
  - Southern Cross University
  - University of Adelaide

The Council of Heads of Australian Faunal Collections (CHAFC)

The Council of Heads of Australian Entomological Collections (CHAEC)

The Council of Heads of Australasian Collections of Microorganisms (CHACM)

The Council of Australasian Museum Directors (CAMD)

An Australian Government Initiative

National Collaborative Research Infrastructure Strategy

ALA Scope

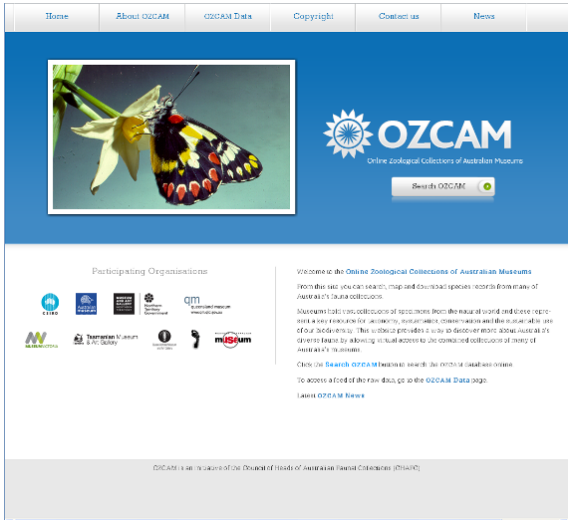
- Integrated picture of Australia's biodiversity
  - Plants, animals and microorganisms
  - Marine and terrestrial
  - Native and non-native

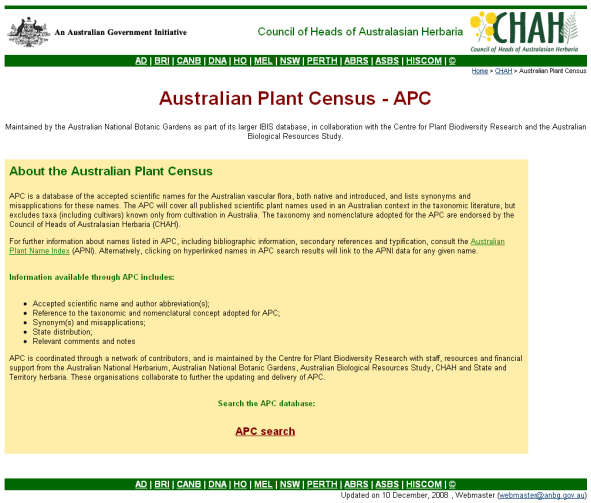
- Information and tools to support:
  - Species identification
  - Taxonomy and collection management
  - Biosecurity
  - Conservation and land-use management
  - Ecological and agricultural research
  - Education

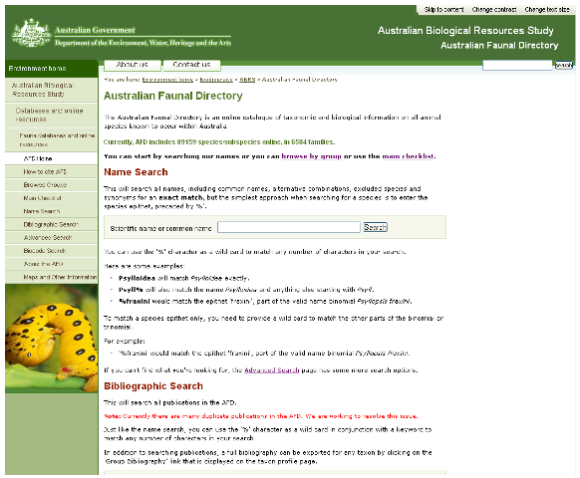
Philosophy

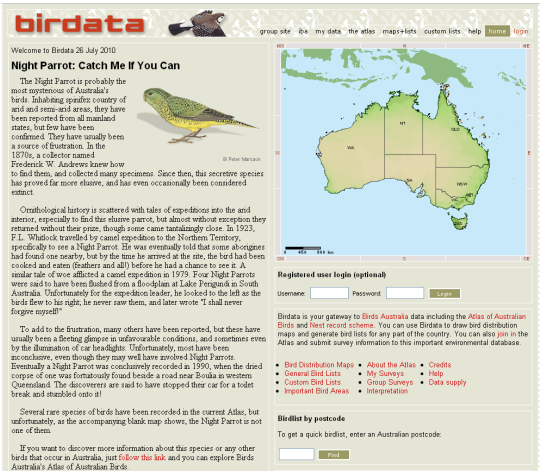
- Collaborative
  - Work with whole community
  - Address data sharing and data access
  - Showcase data providers
  - Reinforce existing successful activities
- Open access
  - But enable access to restricted data
- Comprehensive discovery portal
  - But supply tools and content to use anywhere
- Data quality
  - Automated analysis
  - User annotation
  - Feedback to providers – close the loop

Building on the work of others



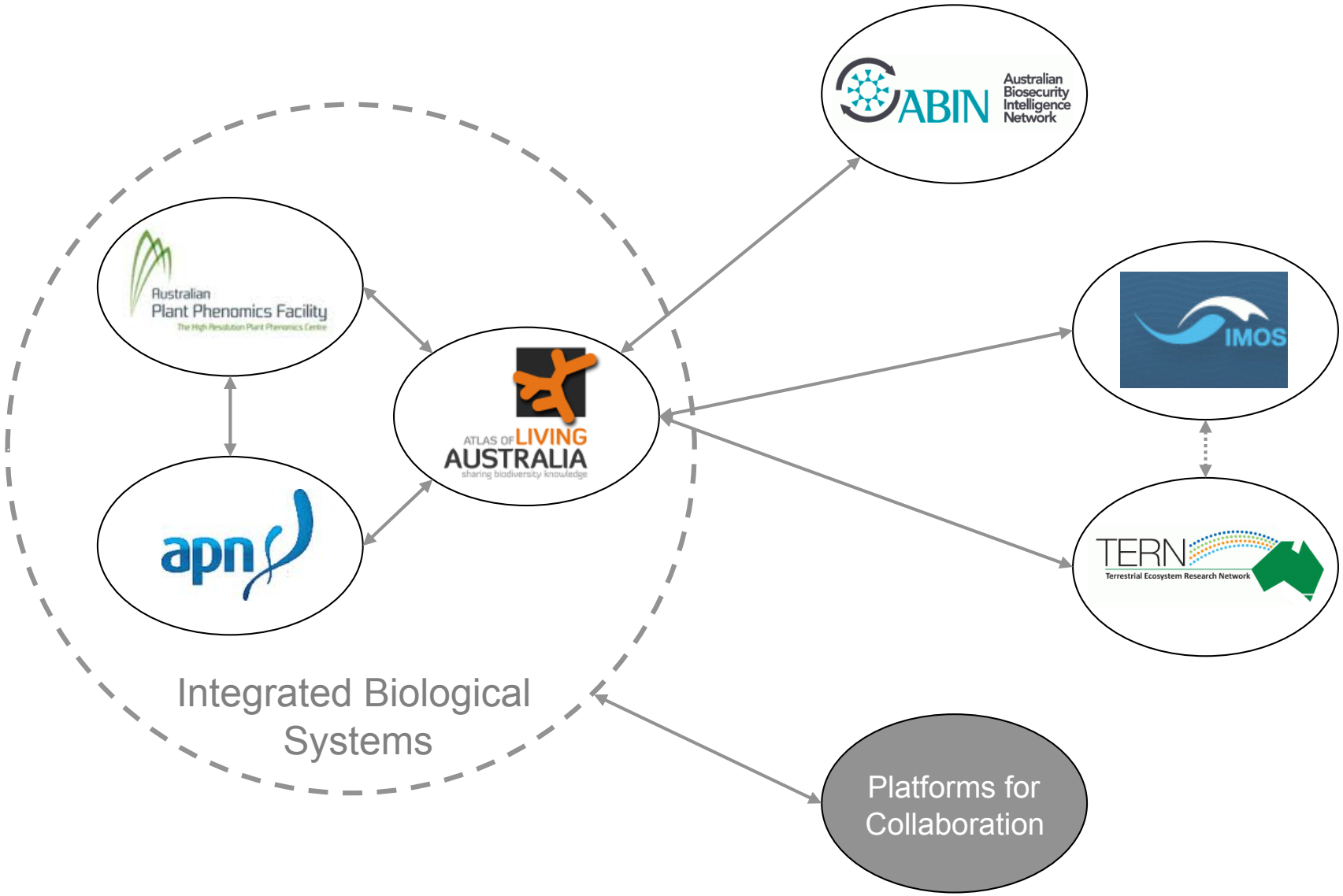




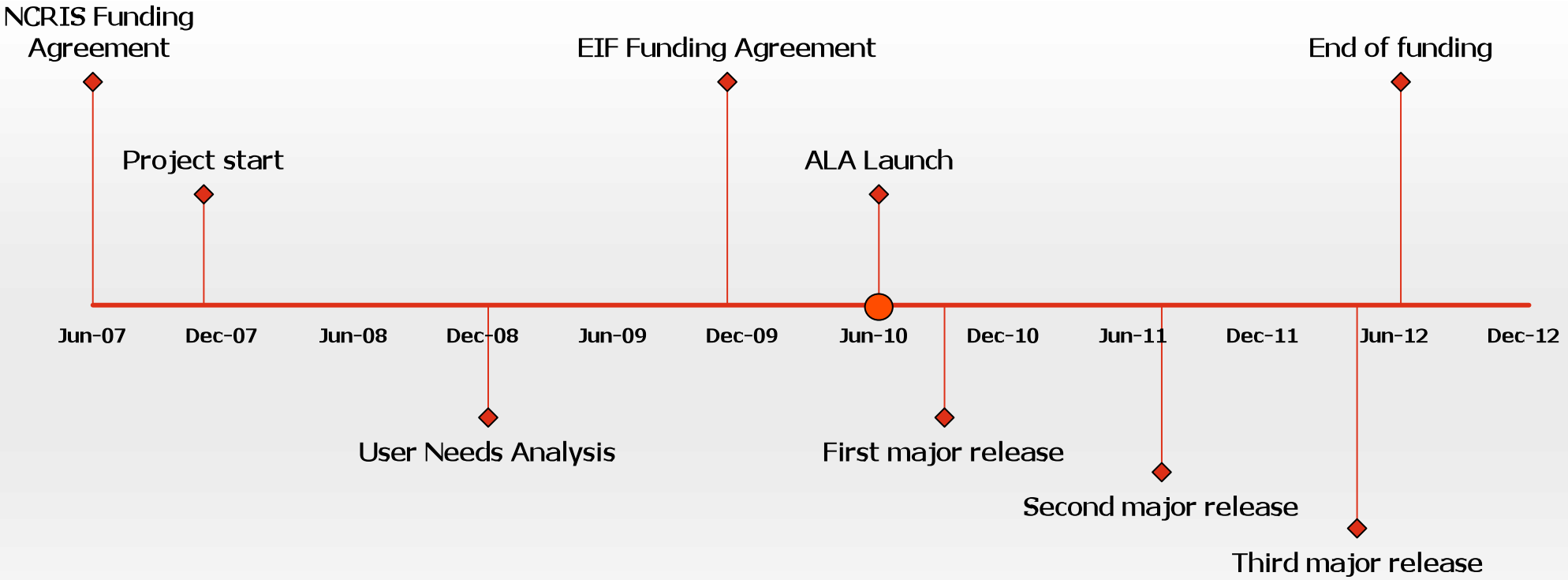


… and the Global Biodiversity Information Facility, Catalogue of Life, Encyclopedia of Life, Biodiversity Heritage Library, Barcode of Life Database, Ocean Biogeographic Information System, Morphbank, Taxonomic Databases Working Group, etc.

NCRIS context



ALA timeline



User needs analysis

- Key user tasks
  - Distribution analysis
  - Identification
  - Site Assessment
  - Habitat management planning
  - Managing reference databases
  - Public education / fact-finding
  - Synecology / food-web analysis
  - Biosecurity

- Major interests
  - Resolving scientific names
  - Integrating amateur observations
  - Issues around sensitive data

Australian National Species Lists

Most people interviewed for this study indicated difficulties with discovering correct names of organisms for use in their work.

ALA User Needs Analysis

Australian National Species Lists
Addressing gaps

- Existing reference lists:
  - Australian Faunal Directory (AFD)
  - Australian Plant Census (APC)
  - Interactive Catalogue of Australian Fungi (ICAF)
  - Australian Marine Algal Name Index (AMANI)
  - Census of Freshwater Algae of Australia
  - AusMoss
- Significant gaps today
- Work through ABRS & CHAH
  - Add missing groups
  - Revise outdated taxonomy
  - Integrate access to all lists

Group	Described Species	To Be Added	To Be Updated
Vertebrates, including:	**8,128**		**3,090**
Birds			200
Fishes			1,000
Mammals			390
Reptiles & Frogs			1,200
Invertebrates, including:	**98,703**	**24,440**	**25,060**
Insects: Beetles		9,500	2,000
Insects: Moths		10,000	
Insects: Flies			4,000
Insects: Wasps		200	3,000
Insects: Other			1,000
Mollusca			8,000
Crustacea		200	2,600
Mites & Ticks		380	2,100
Nematodes		2,000	
Spiders		400	1,000
Miscellaneous		1,760	1,860
Plants, including:	**24,716**	**11,250**	**45,000**
Algae			3,034
Mosses	976		976
Liverworts	841		841
Hornworts	30		30
Fungi	**11,846**	**5,212**	**3,405**
Prokaryota	**189**	**3**	**189**
Chromista	**2,130**	**74**	**0**
Total	**145,712**	**40,979**	**76,744**

Australian National Species Lists
Current situation (complex)

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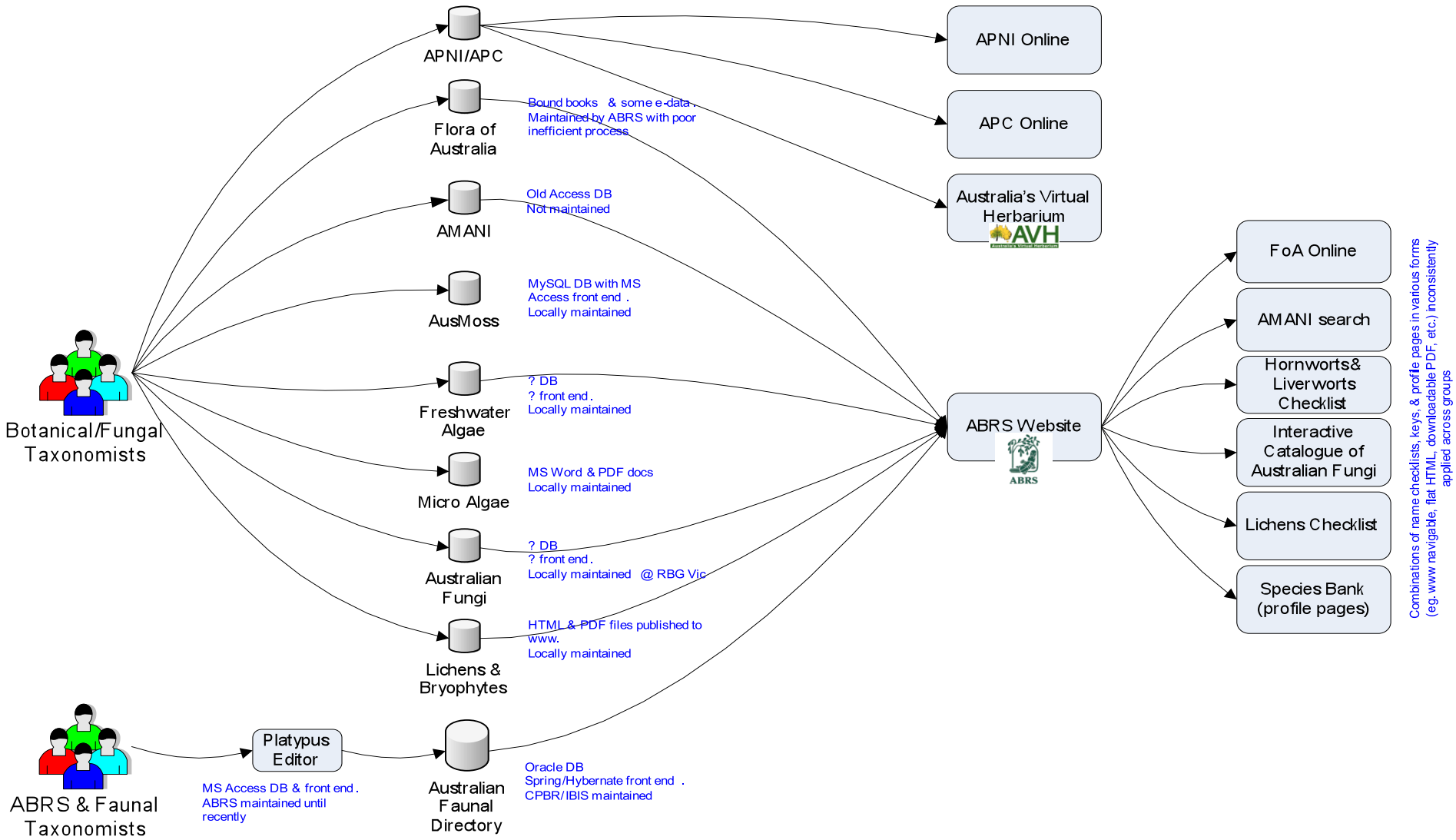
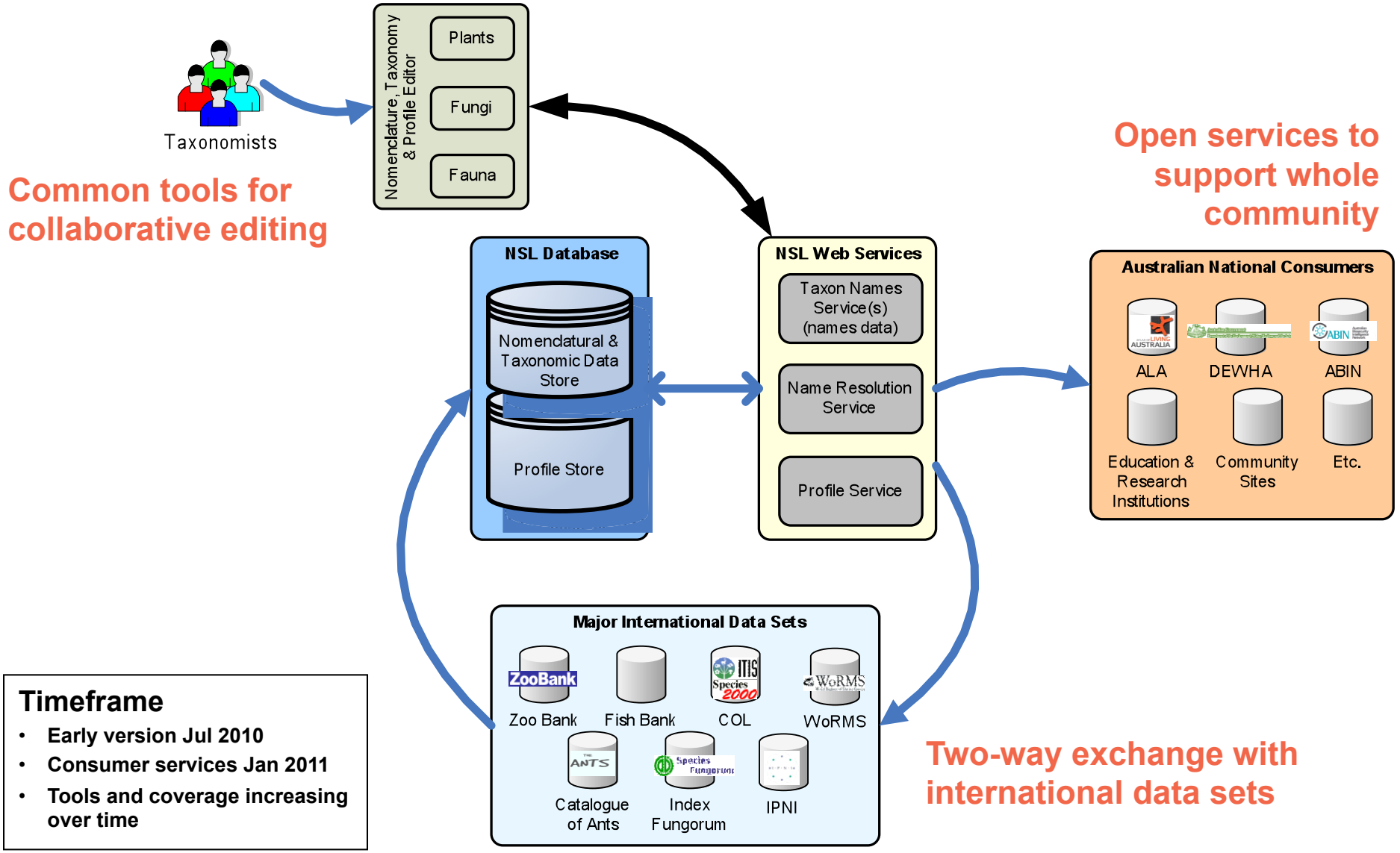
Pre-ALA



Australian National Species Lists
Project goals



Timeframe

- **Early version Jul 2010**
- **Consumer services Jan 2011**
- **Tools and coverage increasing over time**

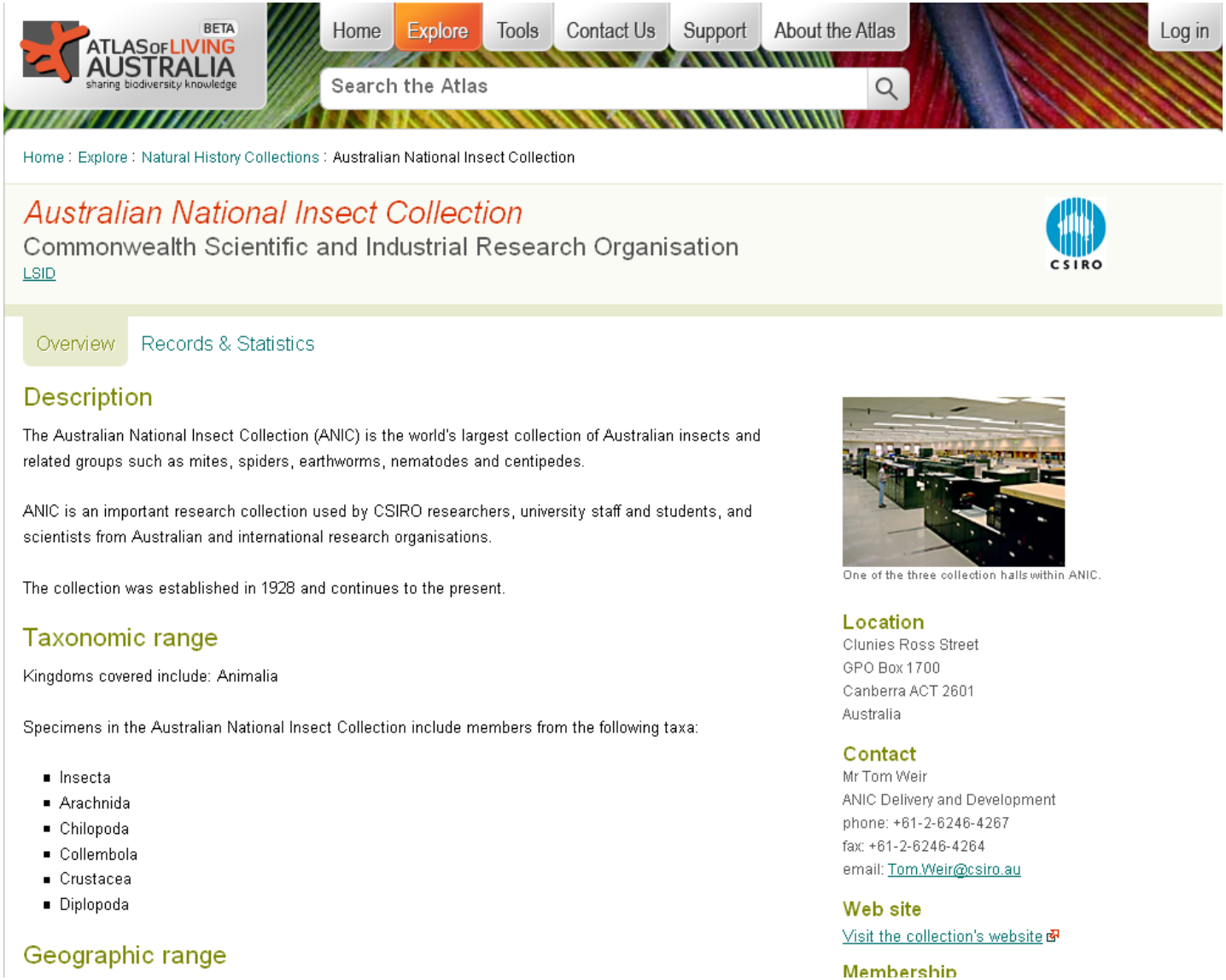
Specimen and observation data

Distribution analysis has been the dominant task in our study. For a user, the ability to retrieve information spatially will be essential – varying in time, varying in scale, with many different forms of content.

ALA User Needs Analysis

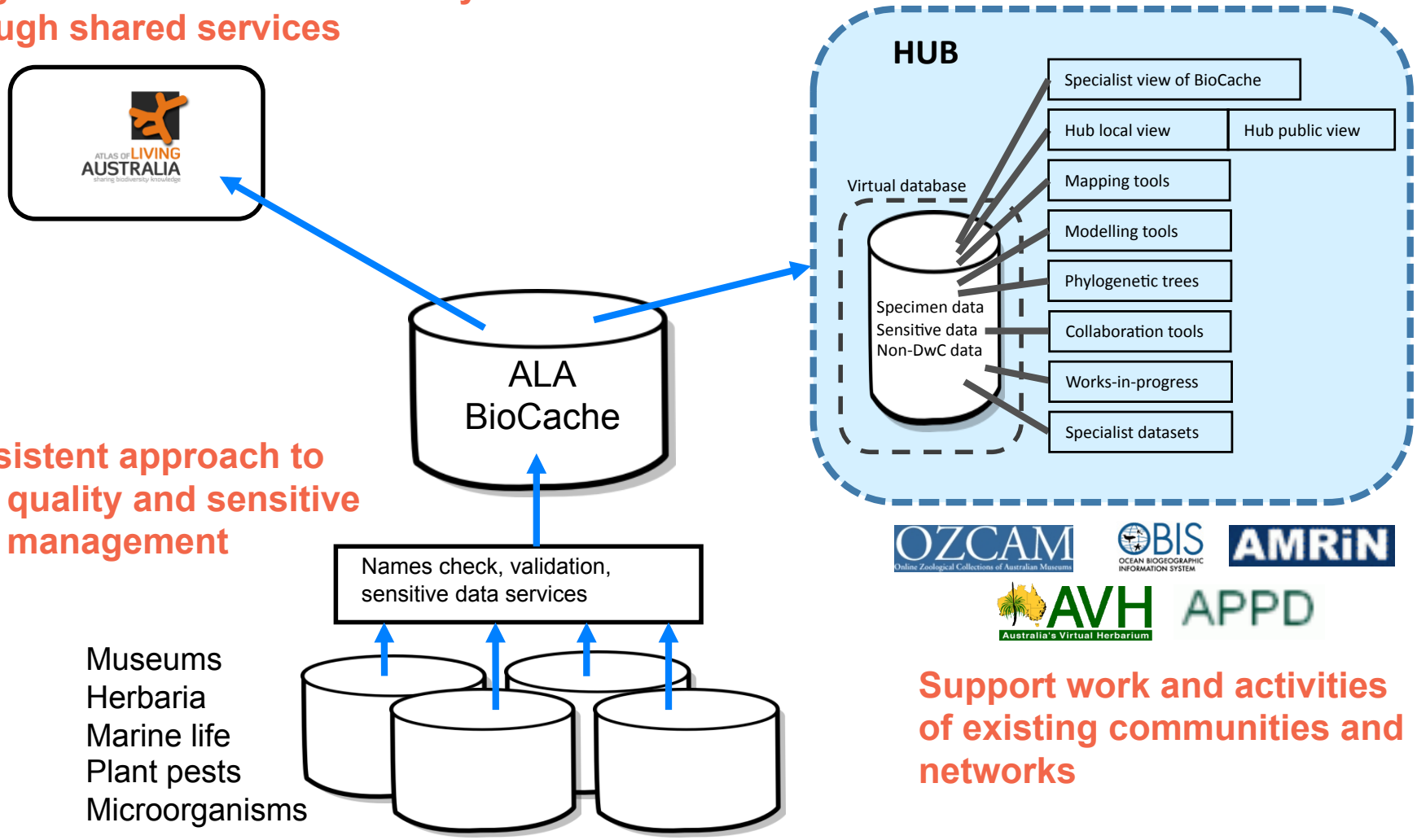
Collection metadata

Collection metadata



Collection community hubs

Integrated access and discovery through shared services

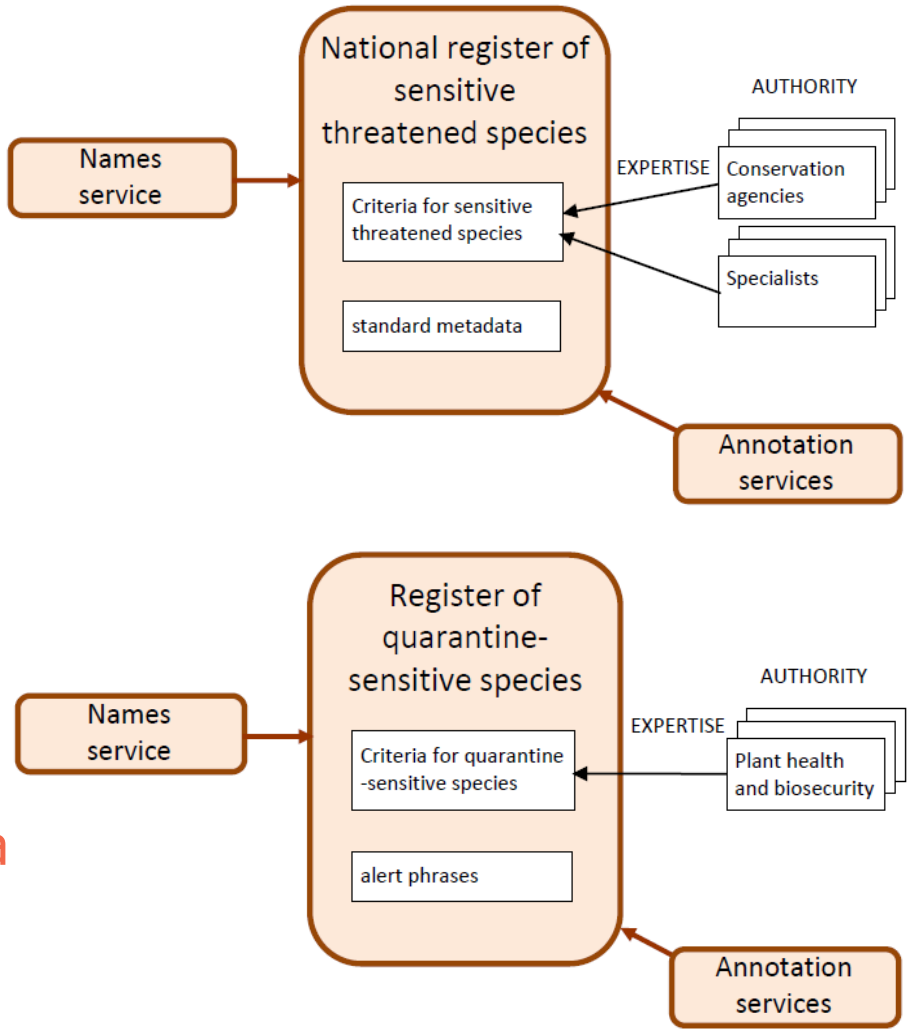


Consistent approach to data quality and sensitive data management

Support work and activities of existing communities and networks

Sensitive Data Service

- Sensitive geospatial data
  - Threatened species
  - Quarantine-sensitive species
- Registers of sensitive species
  - Conservation agencies
  - Biosecurity agencies
  - National and state-by-state
- Configurable rules
  - Suppress from public views
  - Reduce coordinate precision
  - Require additional metadata
- Timeline
  - Standalone tool to check data (April 2011)
  - Integrated into data integration (June 2011)



Imaging collections

Infrastructure to capture and manage images of collection materials

- **Shared access to specialist imaging equipment**
- **Experiments in rapid digitisation**
- **Workflow for storing and documenting images**

Type specimens

- **Support taxonomic research**
- **Reduce need for loans**

Diagnostic images

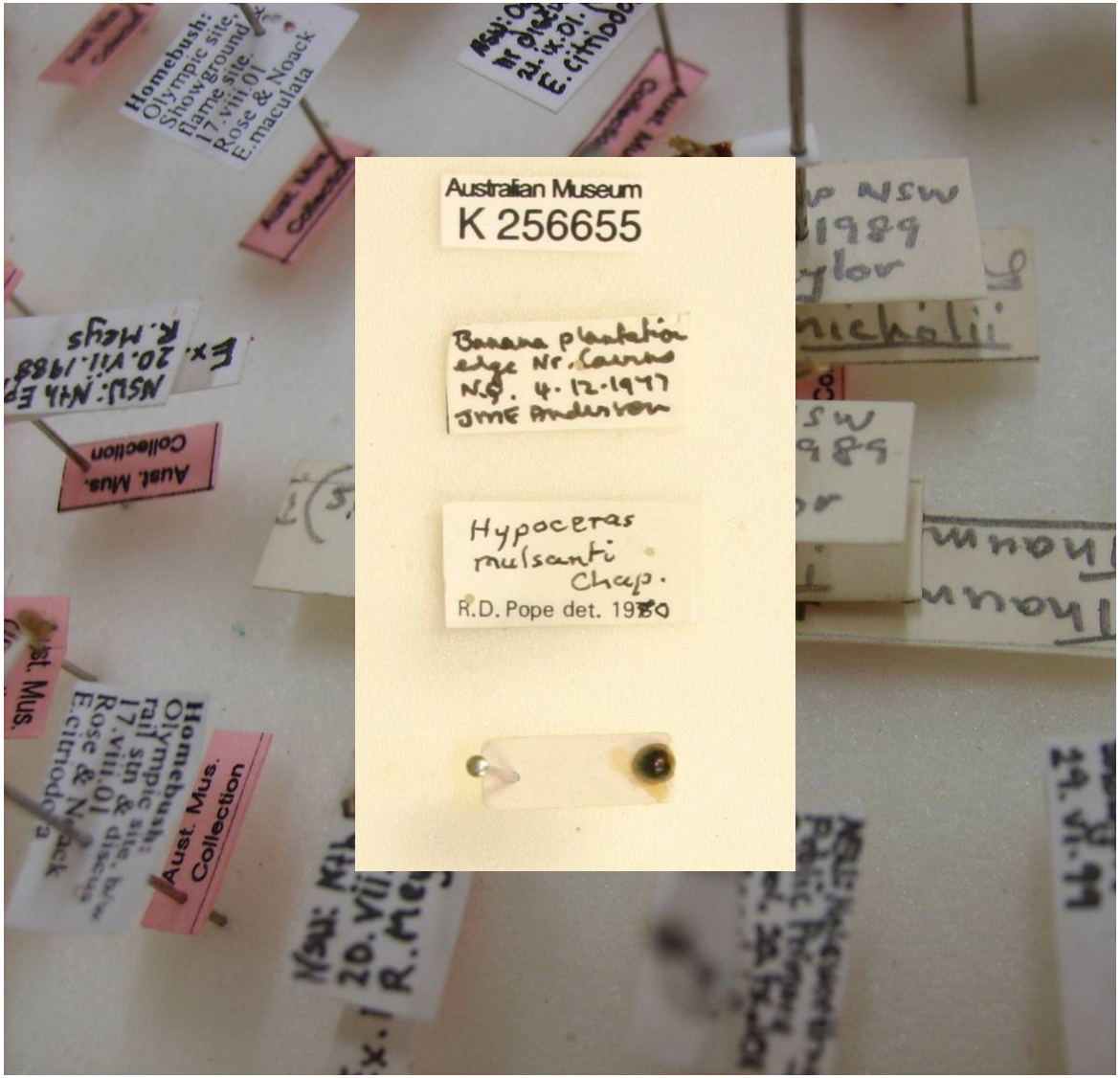
- **Support taxonomic research**
- **Biosecurity identification tools**

Collection accessibility

- **Rapid initial digitisation**
- **Access to notebooks, drawer images, etc.**

Drawer images

Volunteer contributions



Institution code	AM
Collection code	AM-Beetles
Catalogue No	K256655
Basis of record	specimen
Identifier name	R.D. Pope
Date identified (yyyy-mm-dd)	1980
Field number	
Collector name	J.M.E. Anderson
Date collected (yyyy-mm-dd)	1947-12-04

Scientific name	Hypoceras mulsanti
Author	Hypoceras mulsanti Cha
Kingdom	Animalia
Phylum	Arthropoda
Class	Insecta
Order	Coleoptera
Family	Coccinellidae
Genus	Hypoceras

State/Territory	Queensland
Locality	Banana plantation edge Nr. Cairns N.Q.
Latitude (in degrees)	
Longitude (in degrees)	

Amateur observations

Amateur observations and ad hoc data – how best to assist and encourage the capture of observational data from amateur naturalists and other independent specialists, and manage issues of quality

ALA User Needs Analysis

Citizen Science
Amateur observations

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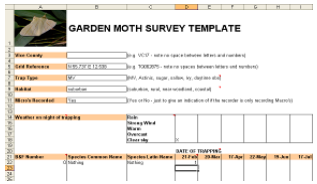
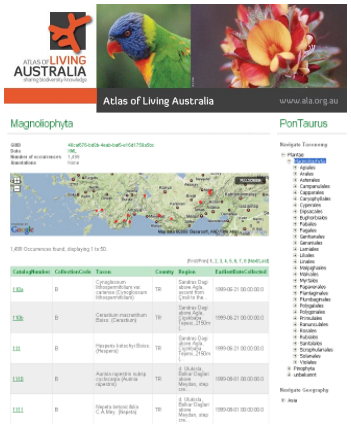
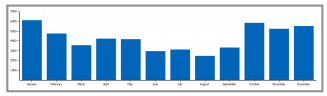
Observers

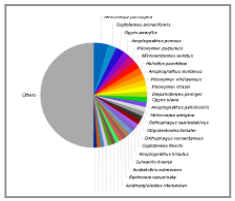
Data Input



Personal Data







Projects

climatewatch

Birds Australia
CONSERVATION THROUGH KNOWLEDGE

Carnaby's Black-Cockatoo
RECOVERY PROJECT

MUSEUM VICTORIA
Biodiversity Snapshots

Requests, fact sheets, presentations

Close loop between amateur observers and research needs

Descriptive Data

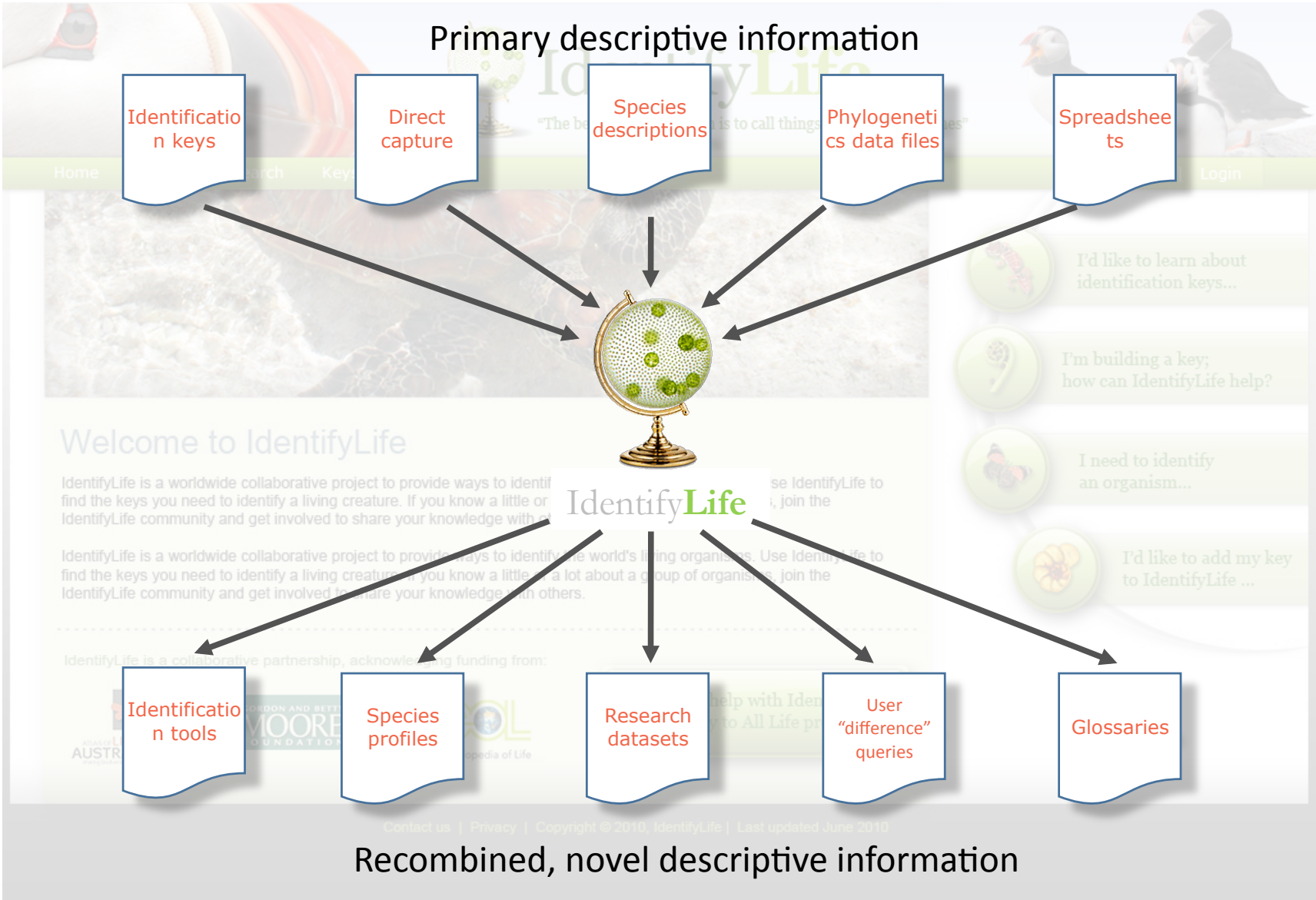
Provision of identification tools and information will need to be in many forms and be able to show many levels of complexity.

There is an underlying emphasis on utility: high-quality photographs, good drawings, clear descriptions, easy-to-use keys.

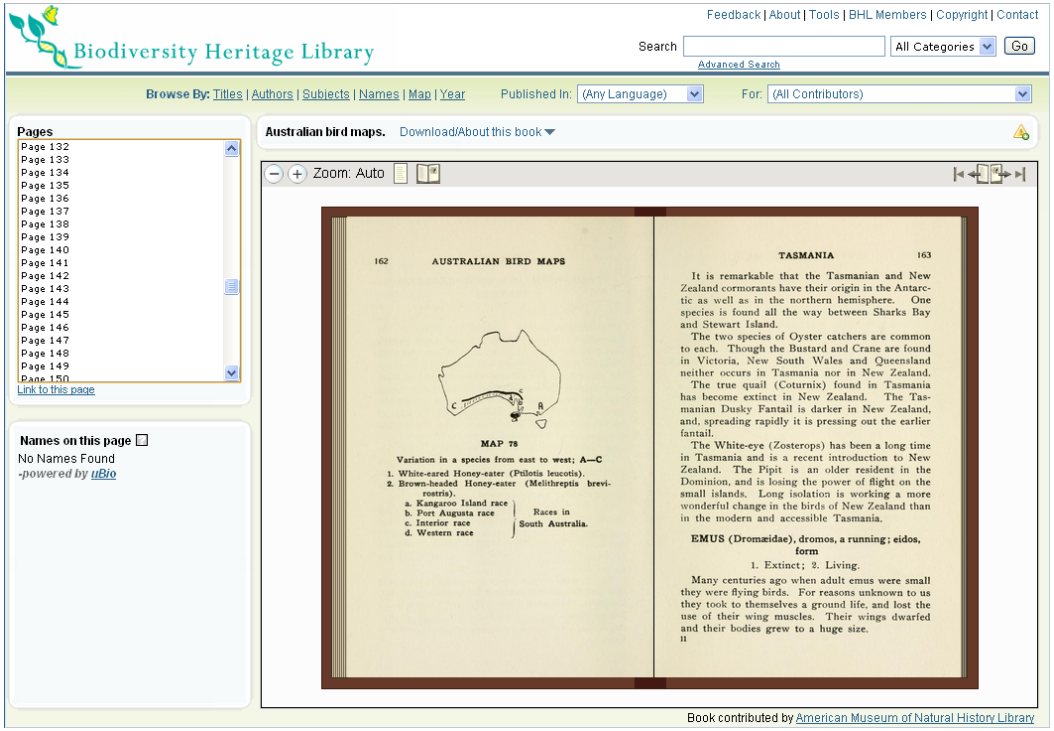
ALA User Needs Analysis

Descriptive Data
IdentifyLife

Descriptive Data
IdentifyLife



Digital Literature
Biodiversity Heritage Library



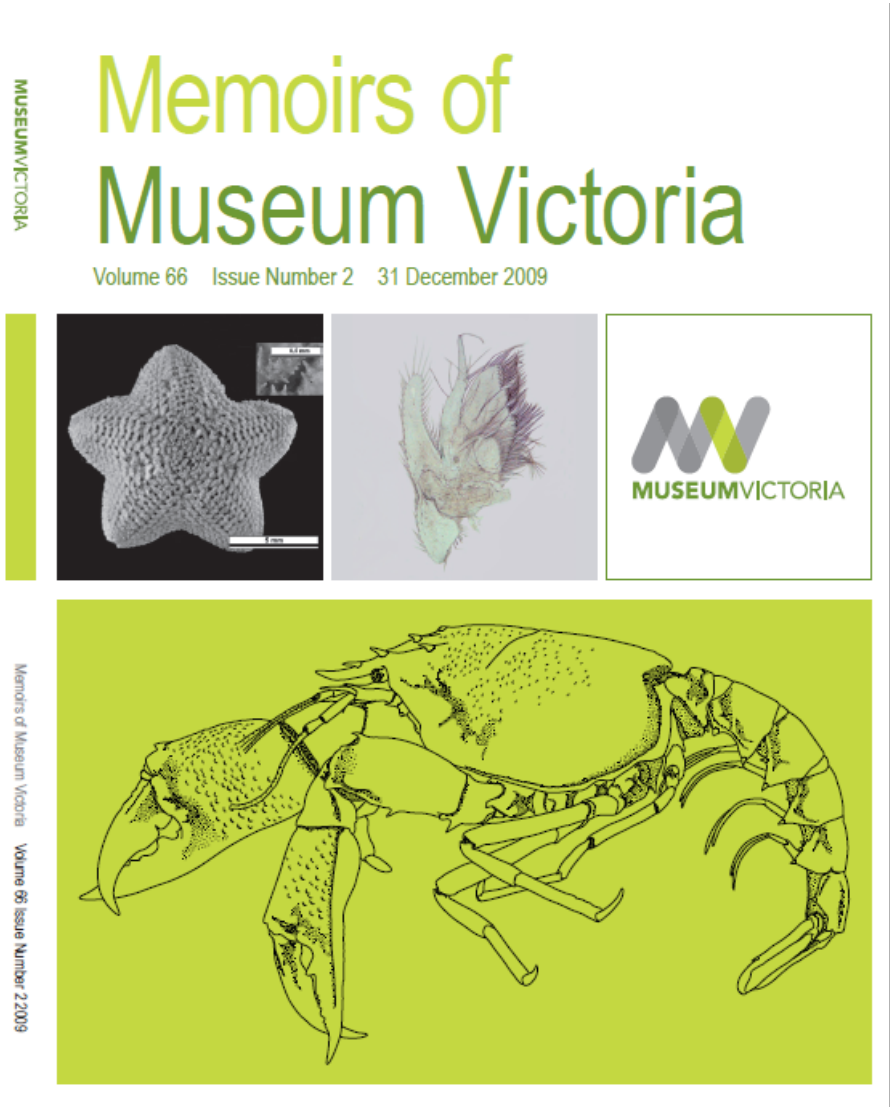
Examples of existing BHL content

- Search for *Acacia*:
  - 34,688 titles
  - 500+ species
- Search for genus *Carcharias*:
  - 4392 titles
- Historical titles such as:
  - ***Illustrations of Australian plants collected in 1770 during Captain Cook's voyage round the world in H.M.S. Endeavour*** - The Right Hon. Sir Joseph Banks and Daniel Solander, with determinations by James Britten
  - ***Handbook to the Birds of Australia*** – John Gould

- BHL projects: USA/UK, Europe, China, Brazil, Australia
- Australian mirror through ALA and Museums Victoria
  - Prioritise addition of Australian content
  - Integrate with ALA and other Australian projects
  - Focus on improving search and annotation capabilities

Digital Literature
Journals relevant to ALA

- Already in BHL (at least partially):
  - Proceedings of the Linnean Society of New South Wales
  - Proceedings of the Royal Society of Victoria
  - Proceedings of the Royal Society of Queensland
  - Transactions of the Royal Society of South Australia
  - Transactions of the Royal Society of Victoria
  - Transactions and Proceedings and Report of the Royal Society of South Australia
  - Transactions of the Philosophical Society of New South Wales
  - South Australian Naturalist
  - Papers and Proceedings of the Royal Society of Tasmania
- Museum journals already scanned include:
  - Records of the Australian Museum
  - Memoirs of the National Museum Victoria
  - Memoirs of the Queensland Museum
  - Kannunnah (Tasmanian Museum and Art Gallery)
- Others
  - Australian Journal of Zoology (CSIRO Publishing to offer 50 years through ALA)



Integrating it all

Uses (biosecurity, land-use, climate change, crop development, resource management, materials, forensics, taxonomy, etc.)

Regional Atlas

Species Pages

Biosecurity Portal

Annotation Tools

Distribution

Metadata repository

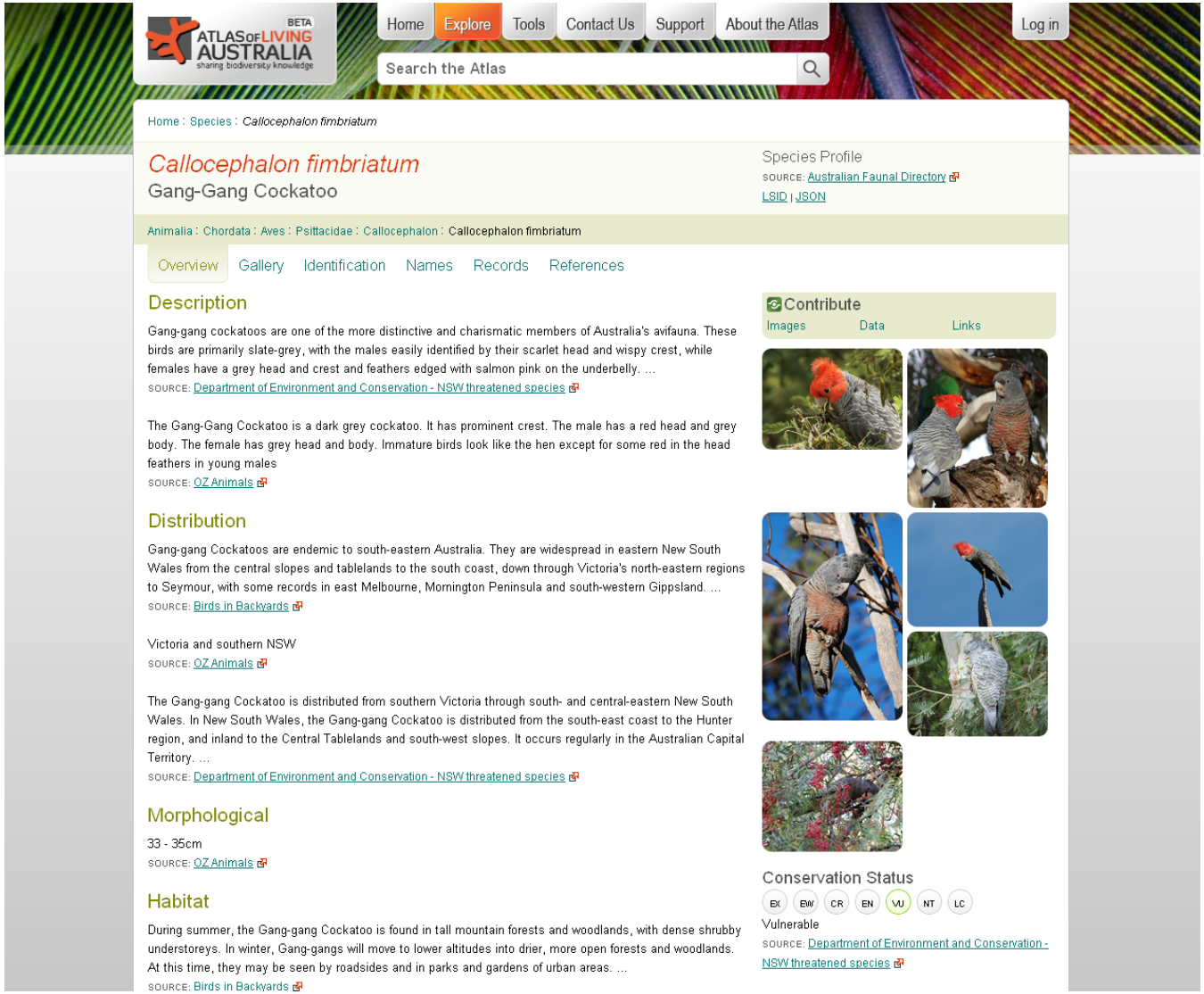
Names and Classification

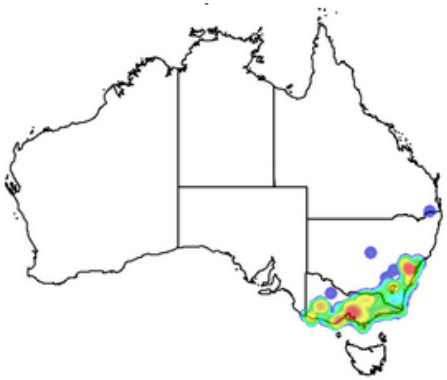
Links to international projects

Metadata (source, methods, ownership, access, etc.)

Data (collections, field observations, literature, molecular, images, expert knowledge, etc.)

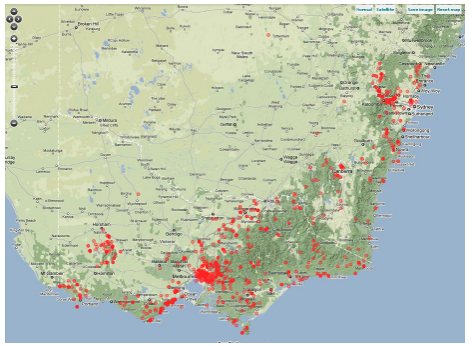
Integrating it all
Species information





Resources contributing to this page

- Australian Faunal Directory
- Catalogue of Life: 2010 Annual Checklist
- Interim Register of Marine and Non-marine Genera
- Birds in Backyards
- Department of Environment and Conservation - NSW threatened species
- Australian Faunal Directory
- Flickr EOL
- Wikipedia
- OZ Animals
- OZ Animals



Integrating it all
Geospatial data

ATLAS OF LIVING AUSTRALIA

BETA ATLAS OF LIVING AUSTRALIA sharing biodiversity knowledge

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Search the Atlas

Home : Explore : Your Area

Explore Your Area

Enter your location or address:

11 nicholson street, carlton Search

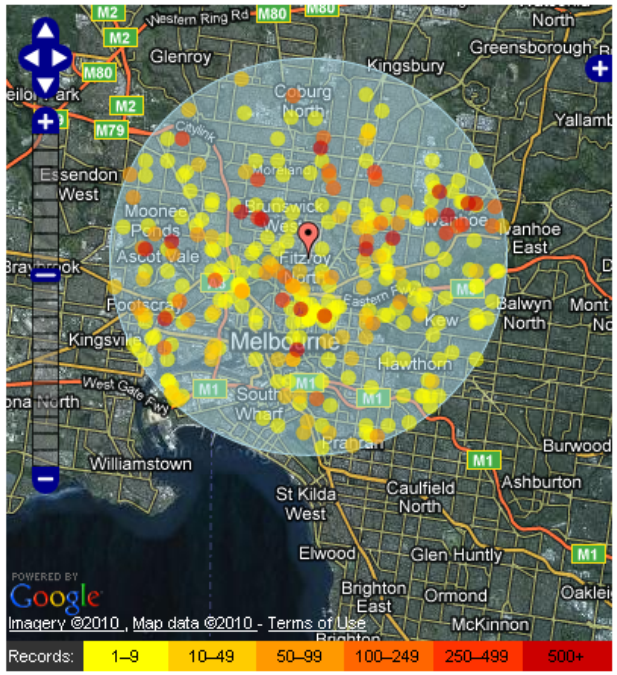
Showing records for: **11 Nicholson St, Carlton VIC 3053, Australia**

Display records in a 10 km radius Reload

Group	Count
All Species	1941
Animals	1147
Mammals	38
Birds	283
Reptiles	28
Amphibians	13
Fish	0
Insects	365
Plants	370
Fungi	69
Chromista	15
Protozoa	0
Bacteria	1

Species Download

1. *Acridotheres tristis* - (866 records)
2. *Tachybaptus novaehollandiae* - Australasian Grebe (820 records)
3. *Streptopelia chinensis* - Spotted Turtle-dove (743 records)
4. *Turdus merula* - Common Blackbird (731 records)
5. *Gralina cyanoleuca* - Magpie-lark (721 records)
6. *Trichoglossus haematodus* - Rainbow Lorikeet (685 records)
7. *Anthochaera carunculata* - (682 records)
8. *Sturnus vulgaris* - Common Starling (681 records)



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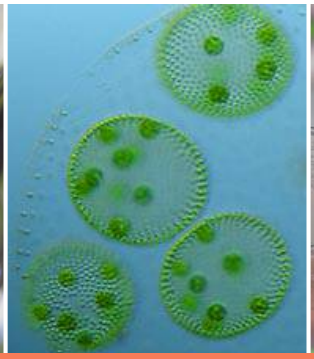
How to participate

- Comments, criticisms, concerns
  - Email: Donald Hobern, Donald.Hobern@csiro.au
- Share data through the ALA
  - Email: Miles Nicholls, Miles.Nicholls@csiro.au
- Use ALA services and tools
  - Email: David Martin, David.Martin@csiro.au

- Next steps
  - August 2010 onwards: Roadmap development with partners
  - October 2010: Web portal to be launched:
    - Collection Metadata
    - Species overview pages
    - Geospatial portal
    - Citizen science projects


The Atlas of Living Australia Participants

www.ala.org.au

Australian museum
nature culture discover

MUSEUMVICTORIA

Queensland Government

qm queensland museum www.qm.qld.gov.au

Tasmanian Museum & Art Gallery

Tasmania
Explore the possibilities

Australian Government
Department of the Environment, Water, Heritage and the Arts

ABRS

CSIRO

Australian Government
Department of Agriculture, Fisheries and Forestry

THE UNIVERSITY OF ADELAIDE
AUSTRALIA

CHAH
Council of Heads of Australasian Herbaria

Southern Cross UNIVERSITY
A new way to think

South Australian Museum

MUSEUM AND ART GALLERY NORTHERN TERRITORY

Northern Territory Government

museum

ATLAS OF LIVING AUSTRALIA
sharing biodiversity knowledge

The Council of Heads of Australian Faunal Collections (CHAFC)

The Council of Heads of Australian Entomological Collections (CHAEC)

The Council of Heads of Australasian Collections of Microorganisms (CHACM)

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