



[www.ala.org.au](http://www.ala.org.au)

# Atlas of Living Australia

## Infrastructure for Biodiversity Research

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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

- 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**



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



Council of Heads of Australasian Herbaria



Southern Cross  
UNIVERSITY  
A new way to think

- **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**

South Australian Museum



MUSEUM  
AND ART  
GALLERY  
NORTHERN  
TERRITORY



Northern  
Territory  
Government



WESTERN AUSTRALIAN  
museum

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)

- **Universities:**

- **Southern Cross University**
- **University of Adelaide**



An Australian Government Initiative  
National Collaborative Research  
Infrastructure Strategy

- 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

- 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



The AVH website features a central image of a large, vibrant flower. To the left, there is a vertical navigation menu with links for 'Query AVH', 'About AVH', 'Partners', 'Sponsors', and 'Credits'. Below the main image, there are several smaller circular images showing different plant specimens. At the bottom, there is a row of logos for various partner institutions and a footer with copyright information.

The OZCAM website has a blue header with navigation links: 'Home', 'About OZCAM', 'OZCAM Data', 'Copyright', 'Contact us', and 'News'. The main content area features a large image of a butterfly on a flower. Below this, there is a search bar with the text 'Search OZCAM'. The page also includes a section for 'Participating Organisations' with logos for various museums and institutions, and a section for 'Welcome to the Online Zoological Collections of Australian Museums'.

The BioMaps website has a colorful header with a grid of small images. Below the header, there is a navigation bar with 'Home', 'About', 'Contact', and 'Help'. The main content area is titled 'Welcome to BioMaps' and contains several sections: 'MAP SPECIES RECORDS', 'CREATE A SPECIES LIST', 'TOOLS', and 'FIND FACTSHEETS'. Each section contains a brief description and a search form. At the bottom, there is a logo for 'RioTinto'.

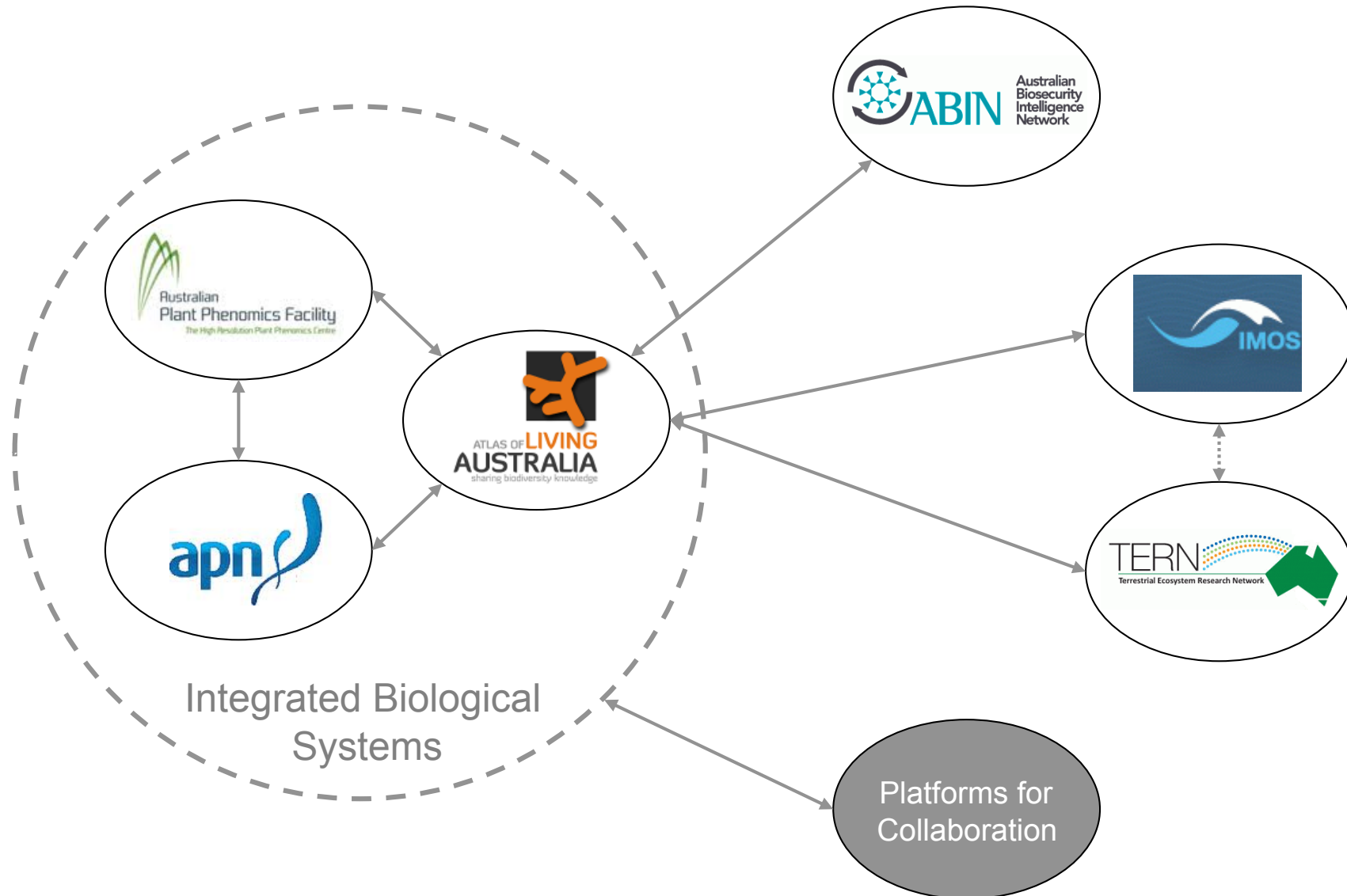
The APC website has a green header with the text 'An Australian Government Initiative' and 'Council of Heads of Australasian Herbaria'. Below the header, there is a navigation bar with links for 'AD | BRI | CANB | DNA | HO | MEL | NSW | PERTH | ABRIS | ASBS | HISCOM |'. The main content area is titled 'Australian Plant Census - APC' and contains sections for 'About the Australian Plant Census' and 'Information available through APC includes:'. The 'About' section describes the APC as a database of accepted scientific names for the Australian vascular flora. The 'Information available' section lists various types of data available, such as accepted scientific names, author abbreviations, and references to taxonomic literature.

The Australian Faunal Directory website has a green header with the text 'Australian Government' and 'Department of the Environment, Water, Heritage and the Arts'. Below the header, there is a navigation bar with links for 'Home', 'About', 'Contact', and 'Help'. The main content area is titled 'Australian Faunal Directory' and contains a search form with the text 'Scientific name or common name'. Below the search form, there is a section for 'Name Search' and a section for 'Bibliographic Search'.

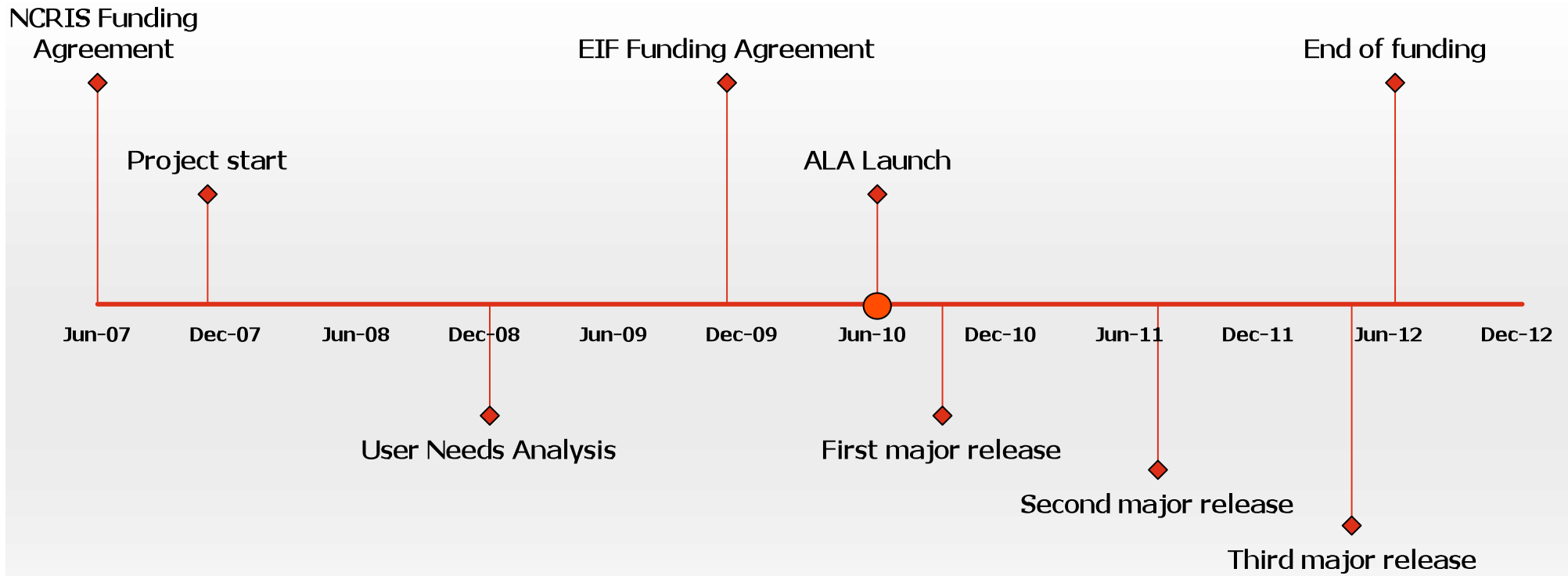
The birdata website has a green header with the text 'Welcome to Birdata 26 July 2010'. Below the header, there is a navigation bar with links for 'group site', 'my data', 'the atlas', 'maps/lists', 'custom lists', 'help', 'home', and 'login'. The main content area is titled 'Night Parrot: Catch Me If You Can' and contains a section for 'Ornithological history' and a section for 'To add to the frustration, many others have been reported, but these have usually been a single glimpse in unfavorable conditions, and sometimes even by the illumination of car headlights. Unfortunately, most have been inconclusive, even though they may well have involved Night Parrots. Presumably a Night Parrot was conclusively recorded in 1990, when the dead corpse of one was fortuitously found beside a road near Boulda in western Queensland. The discoverers are said to have stopped their car for a toilet break, and stumbled onto it! Several rare species of birds have been recorded in the current Atlas, but unfortunately, as the accompanying block may show, the Night Parrot is not one of them. If you want to discover more information about this species or any other birds that occur in Australia, just follow this link and you can explore Birds Australia's Atlas of Australian Birds.'

... 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



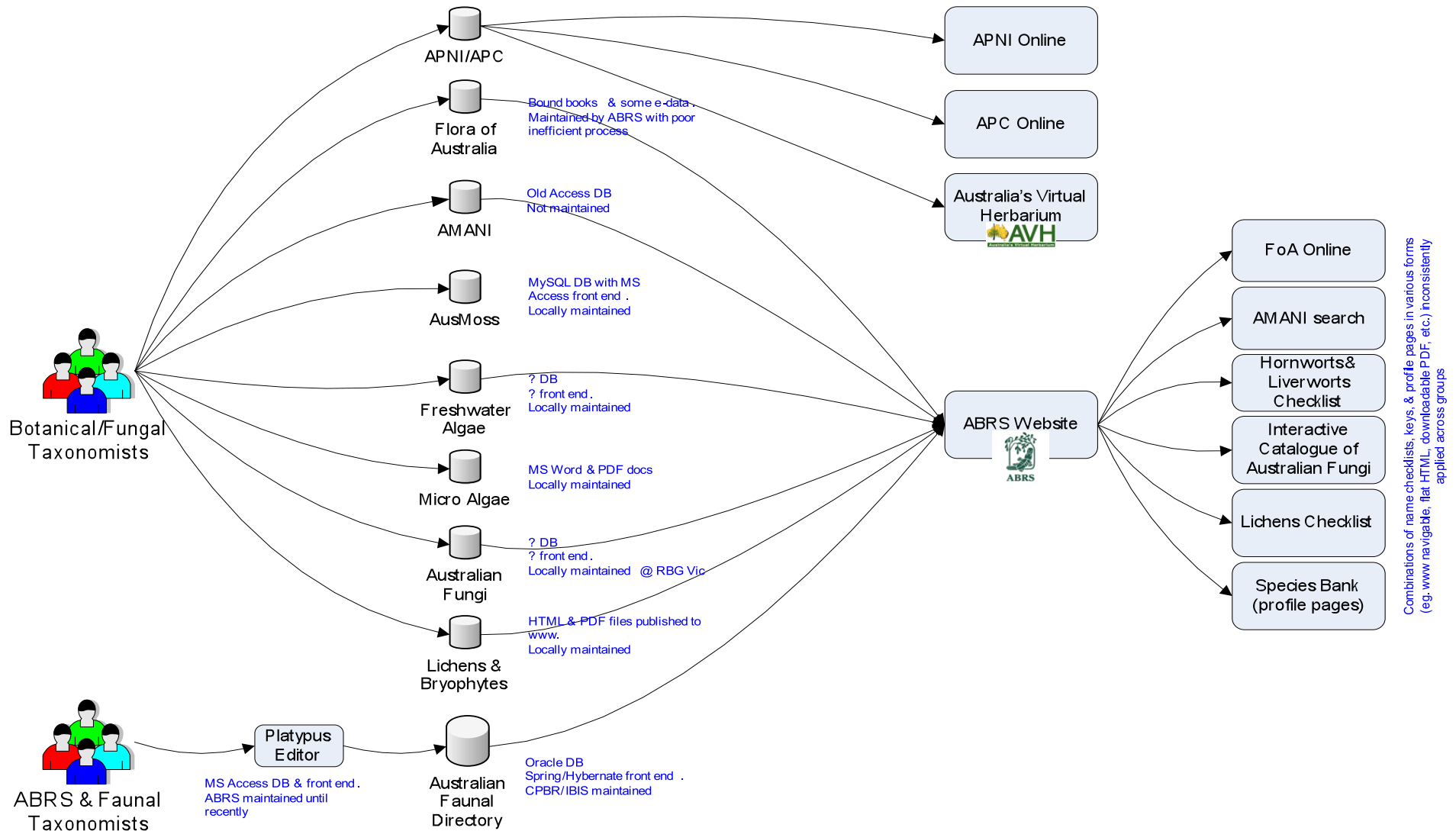
- Existing reference lists:
  - Australian Faunal Directory (AFD)
  - Australian Plant Census (APC)
  - Interactive Catalogue of Australian Fungi (ICAF)
  - Australian Marine Algal Name Index (AMANI)
  - Census of Freshwater Algae of Australia
  - AusMoss
- Significant gaps today
- Work through ABRS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

Group	Described Species	To Be Added	To Be Updated
<b>Vertebrates, including:</b>	<b>8,128</b>		<b>3,090</b>
Birds			200
Fishes			1,000
Mammals			390
Reptiles & Frogs			1,200
<b>Invertebrates, including:</b>	<b>98,703</b>	<b>24,440</b>	<b>25,060</b>
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
<b>Plants, including:</b>	<b>24,716</b>	<b>11,250</b>	<b>45,000</b>
Algae			3,034
Mosses	976		976
Liverworts	841		841
Hornworts	30		30
<b>Fungi</b>	<b>11,846</b>	<b>5,212</b>	<b>3,405</b>
<b>Prokaryota</b>	<b>189</b>	<b>3</b>	<b>189</b>
<b>Chromista</b>	<b>2,130</b>	<b>74</b>	<b>0</b>
<b>Total</b>	<b>145,712</b>	<b>40,979</b>	<b>76,744</b>

# Australian National Species Lists

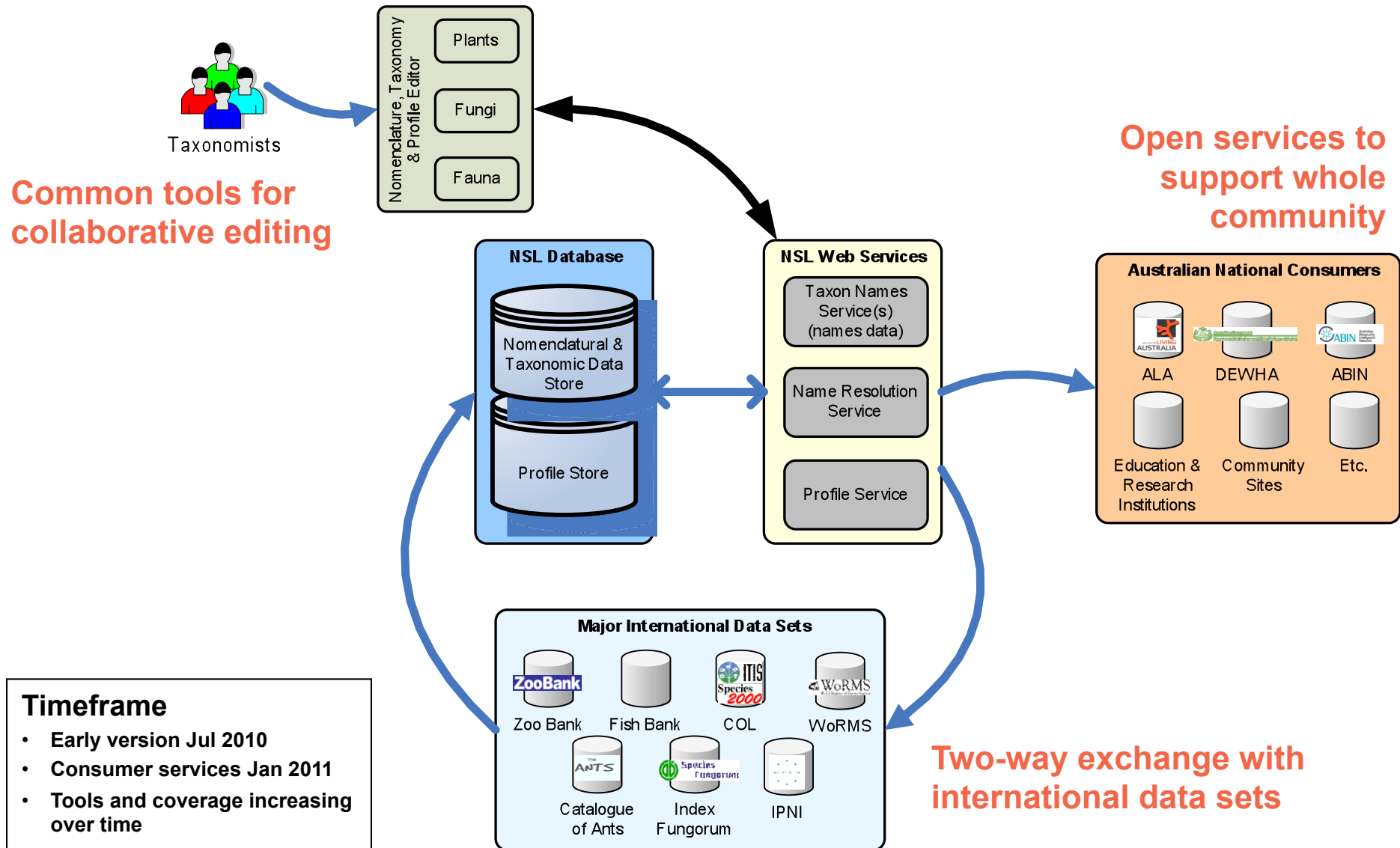
## Current situation (complex)

### Pre-ALA



# Australian National Species Lists

## Project goals



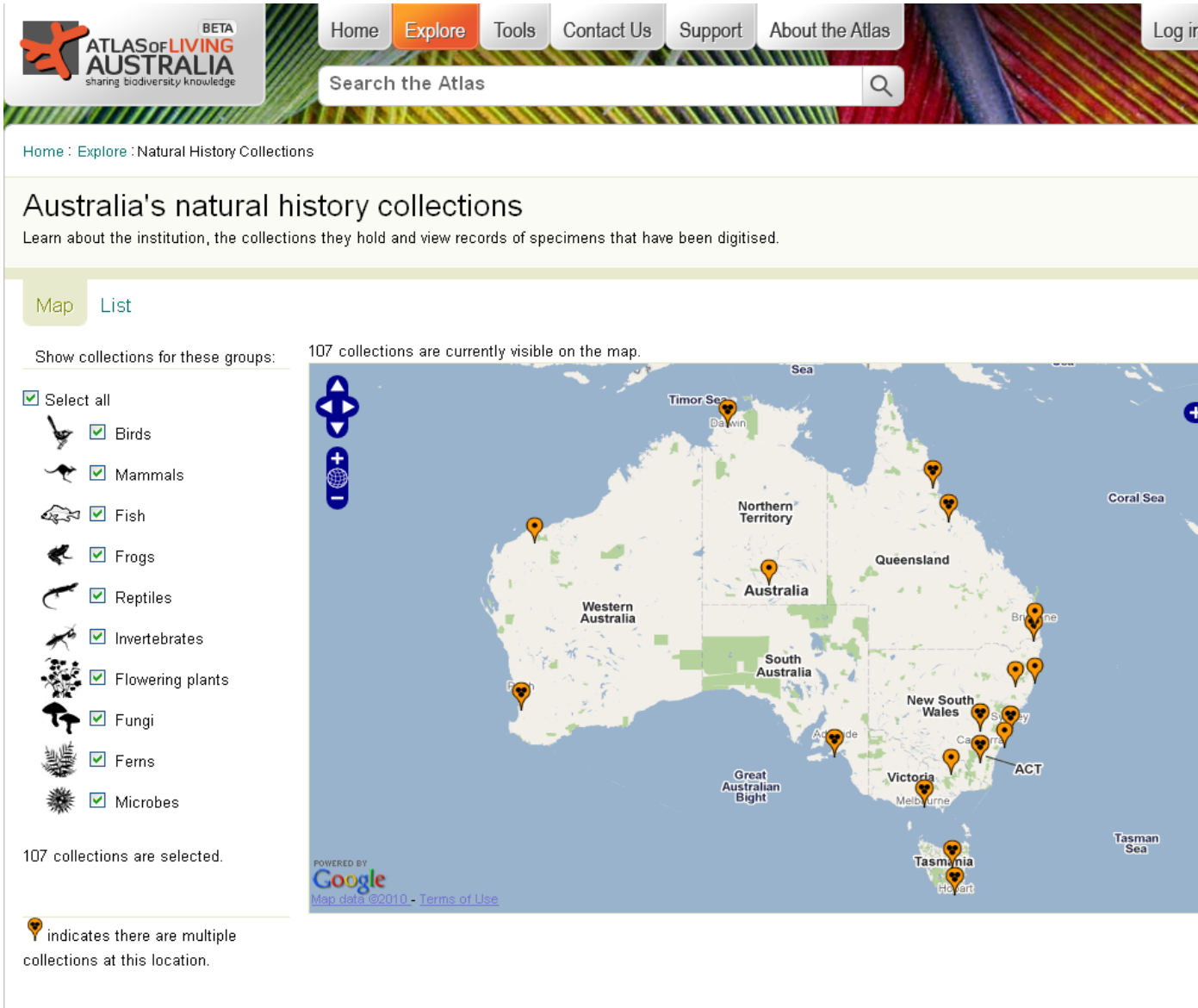
# Specimen and observation data



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



**BETA**  
ATLAS OF LIVING AUSTRALIA  
sharing biodiversity knowledge

Home Explore Tools Contact Us Support About the Atlas Log in

Search the Atlas

Home : Explore : Natural History Collections

## Australia's natural history collections


Learn about the institution, the collections they hold and view records of specimens that have been digitised.


Map List

Show collections for these groups: 107 collections are currently visible on the map.

- Select all
- Birds
- Mammals
- Fish
- Frogs
- Reptiles
- Invertebrates
- Flowering plants
- Fungi
- Ferns
- Microbes

107 collections are selected.


 indicates there are multiple collections at this location.



POWERED BY Google  
Map data ©2010 - Terms of Use

# Collection metadata



BETA  
**ATLAS OF LIVING AUSTRALIA**  
sharing biodiversity knowledge


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Home : [Explore](#) : [Natural History Collections](#) : Australian National Insect Collection

## Australian National Insect Collection

Commonwealth Scientific and Industrial Research Organisation

[LSID](#)



[Overview](#) [Records & Statistics](#)

### Description

The Australian National Insect Collection (ANIC) is the world's largest collection of Australian insects and related groups such as mites, spiders, earthworms, nematodes and centipedes.

ANIC is an important research collection used by CSIRO researchers, university staff and students, and scientists from Australian and international research organisations.

The collection was established in 1928 and continues to the present.

### Taxonomic range

Kingdoms covered include: Animalia

Specimens in the Australian National Insect Collection include members from the following taxa:

- Insecta
- Arachnida
- Chilopoda
- Collembola
- Crustacea
- Diplopoda

### Geographic range



One of the three collection halls within ANIC.

### Location

Clunies Ross Street  
GPO Box 1700  
Canberra ACT 2601  
Australia

### Contact

Mr Tom Weir  
ANIC Delivery and Development  
phone: +61-2-6246-4267  
fax: +61-2-6246-4264  
email: [Tom.Weir@csiro.au](mailto:Tom.Weir@csiro.au)

### Web site

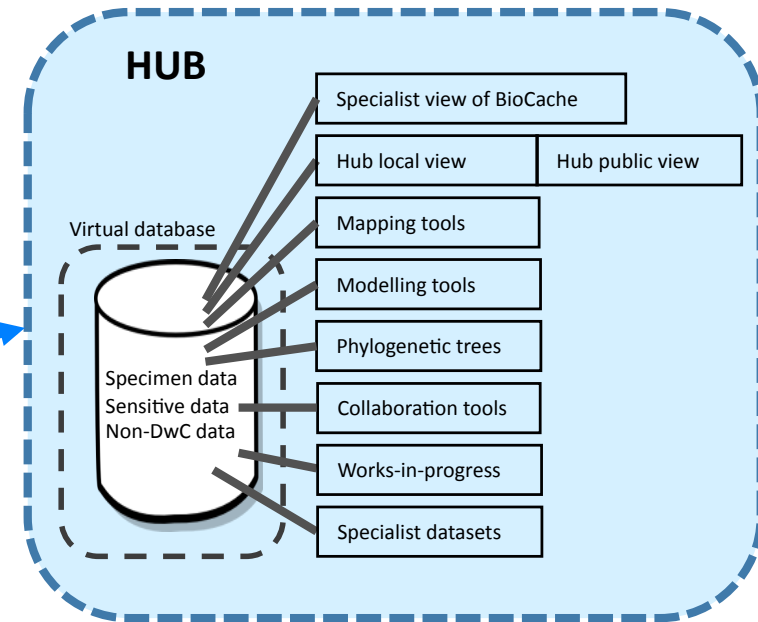
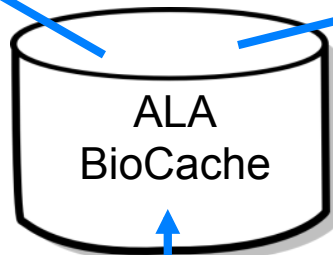
[Visit the collection's website](#)

### Membership

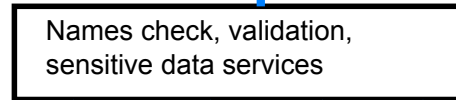


# Collection community hubs

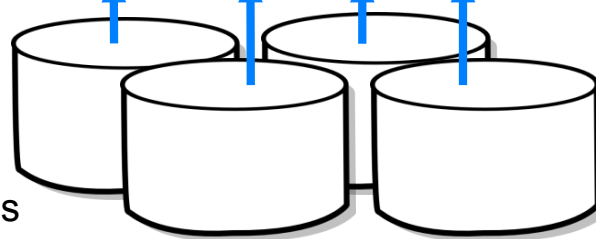
Integrated access and discovery through shared services



Consistent approach to data quality and sensitive data management



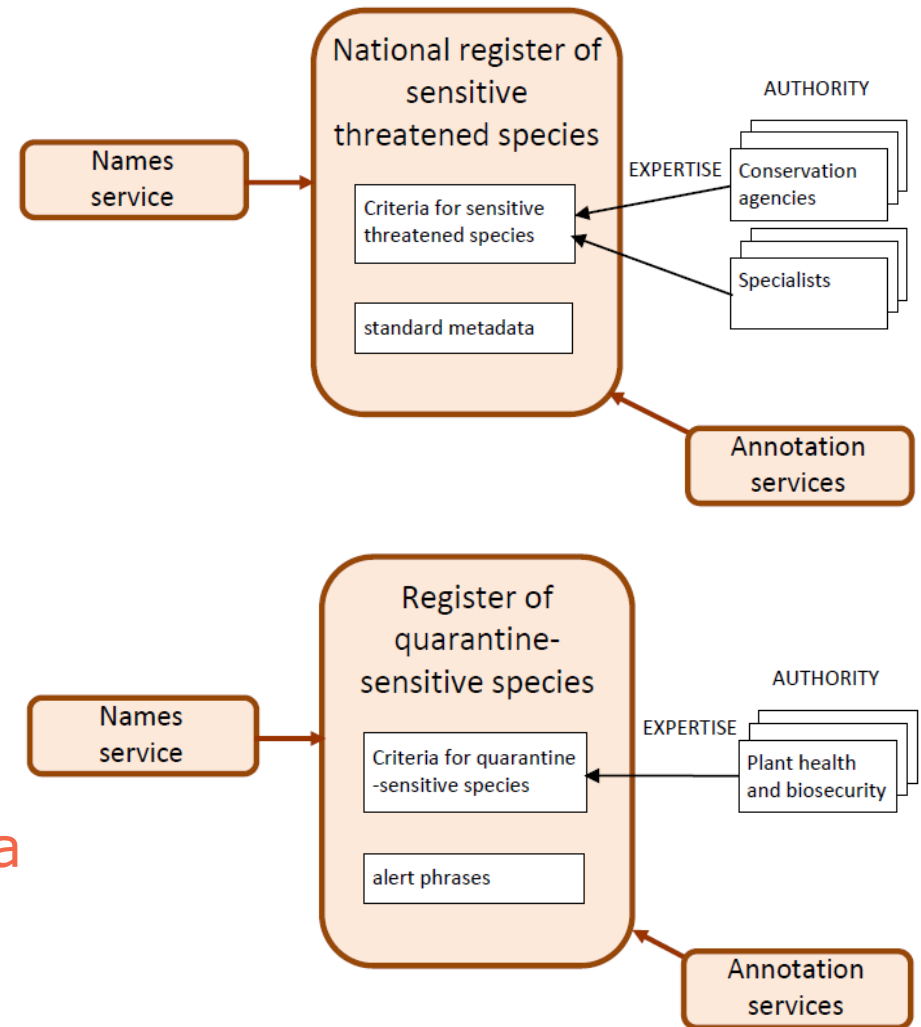
- Museums
- Herbaria
- Marine life
- Plant pests
- Microorganisms



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

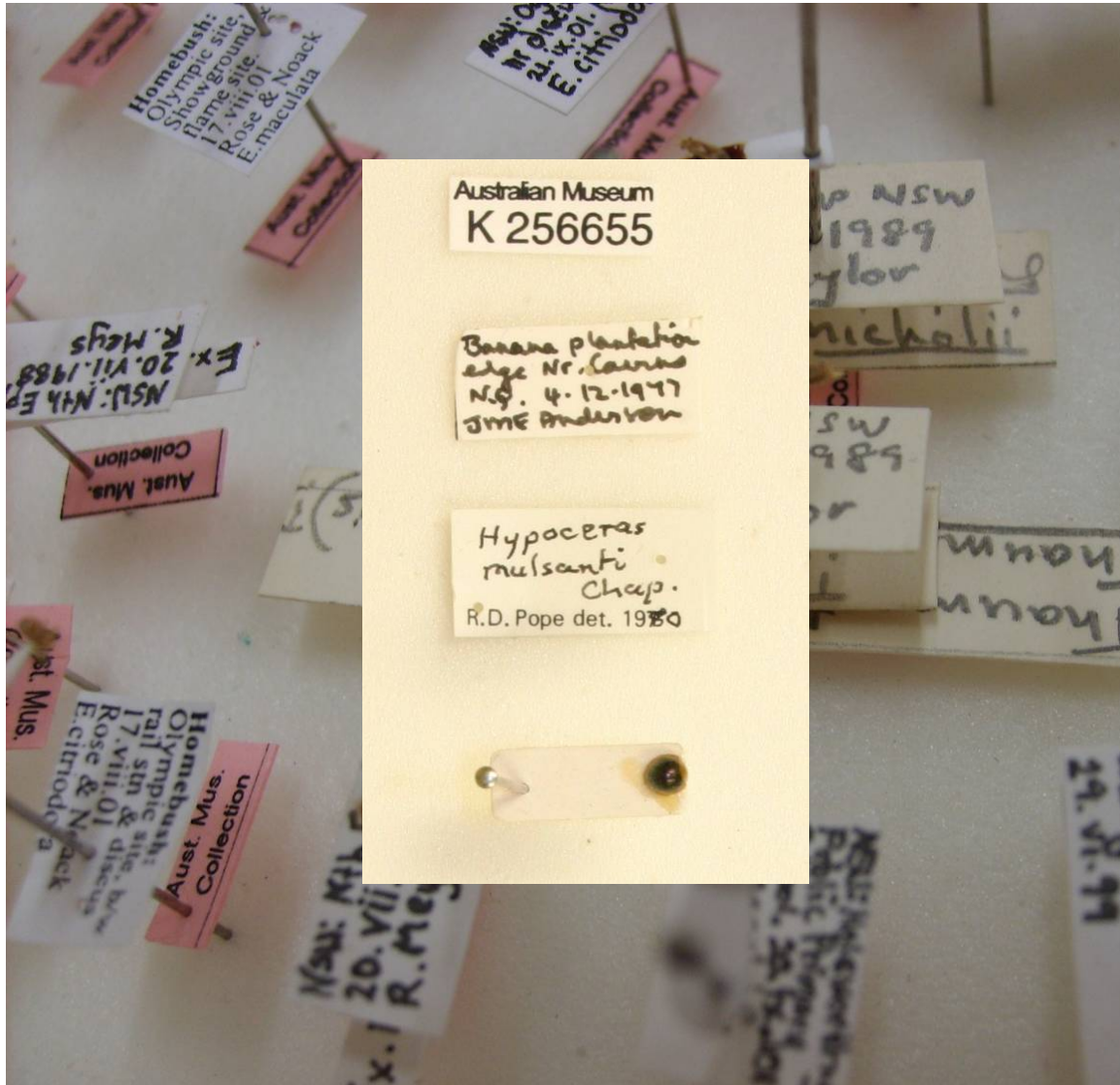


### Collection accessibility

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



# Volunteer contributions



Institution code	AM
Collection code	AM-Beetles
Catalogue No	K256655
Basis of record	specimen <input type="button" value="v"/>
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 <input type="button" value="v"/>
Phylum	Arthropoda
Class	Insecta
Order	Coleoptera
Family	Coccinellidae
Genus	Hypoceras

State/Territory	Queensland <input type="button" value="v"/>
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



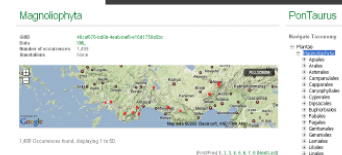
## Observers



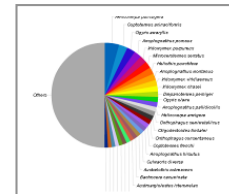
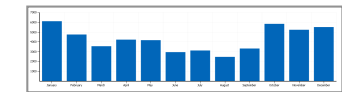
## Data Input



## Personal Data



Colony/Species	Colony Code	Time	Colony	Region	Established/Abandoned
110a	B	1950-1955	Swainson Eggar	SA	1950/06/21 00:00:00
110b	B	1950-1955	Swainson Eggar	SA	1950/06/21 00:00:00
111	B	1950-1955	Swainson Eggar	SA	1950/06/21 00:00:00
112	B	1950-1955	Swainson Eggar	SA	1950/06/21 00:00:00
113	B	1950-1955	Swainson Eggar	SA	1950/06/21 00:00:00



## Projects



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.

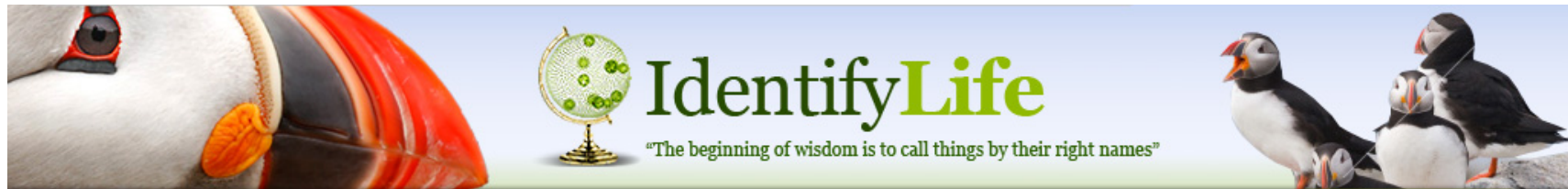
There is an underlying emphasis on utility: high-quality photographs, good drawings, clear descriptions, easy-to-use keys.

*ALA User Needs Analysis*



# Descriptive Data

## IdentifyLife



[Home](#) [Browse](#) [Search](#) [Keys](#) [Help](#)

[Register](#) | [Login](#)



### Welcome to IdentifyLife

IdentifyLife is a worldwide collaborative project to provide ways to identify the world's living organisms. Use IdentifyLife to find the keys you need to identify a living creature. If you know a little or a lot about a group of organisms, join the IdentifyLife community and get involved to share your knowledge with others.

IdentifyLife is a worldwide collaborative project to provide ways to identify the world's living organisms. Use IdentifyLife to find the keys you need to identify a living creature. If you know a little or a lot about a group of organisms, join the IdentifyLife community and get involved to share your knowledge with others.

IdentifyLife is a collaborative partnership, acknowledging funding from:

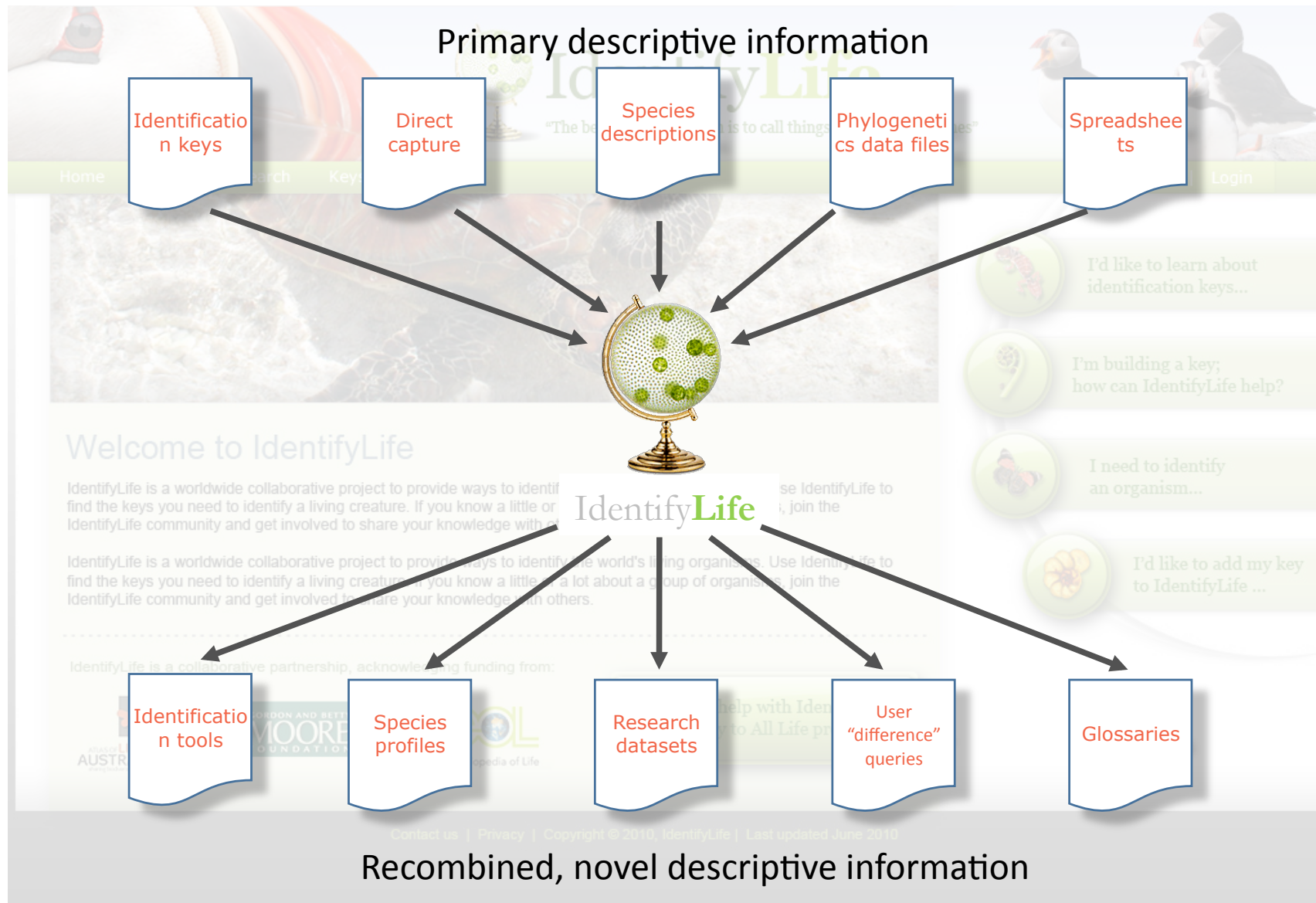


How can I help with IdentifyLife and the Key to All Life project?

-  I'd like to learn about identification keys...
-  I'm building a key; how can IdentifyLife help?
-  I need to identify an organism...
-  I'd like to add my key to IdentifyLife ...

[Contact us](#) | [Privacy](#) | [Copyright © 2010, IdentifyLife](#) | Last updated June 2010

# Descriptive Data IdentifyLife



# Digital Literature Biodiversity Heritage Library



The screenshot shows the Biodiversity Heritage Library interface. At the top, there are navigation links like 'Feedback', 'About', 'Tools', 'BHL Members', 'Copyright', and 'Contact'. A search bar is present with 'Advanced Search' and 'All Categories' options. Below the search bar, there are filters for 'Browse By: Titles | Authors | Subjects | Names | Map | Year' and 'Published In: (Any Language)' and 'For: (All Contributors)'. The main content area shows a search result for 'Australian bird maps'. It includes a thumbnail of a book page with a map of Australia and text about Tasmanian and New Zealand cormorants. A sidebar on the left shows a list of pages from 132 to 150. Below the sidebar, there is a section for 'Names on this page' which is currently empty.

## Examples of existing BHL content

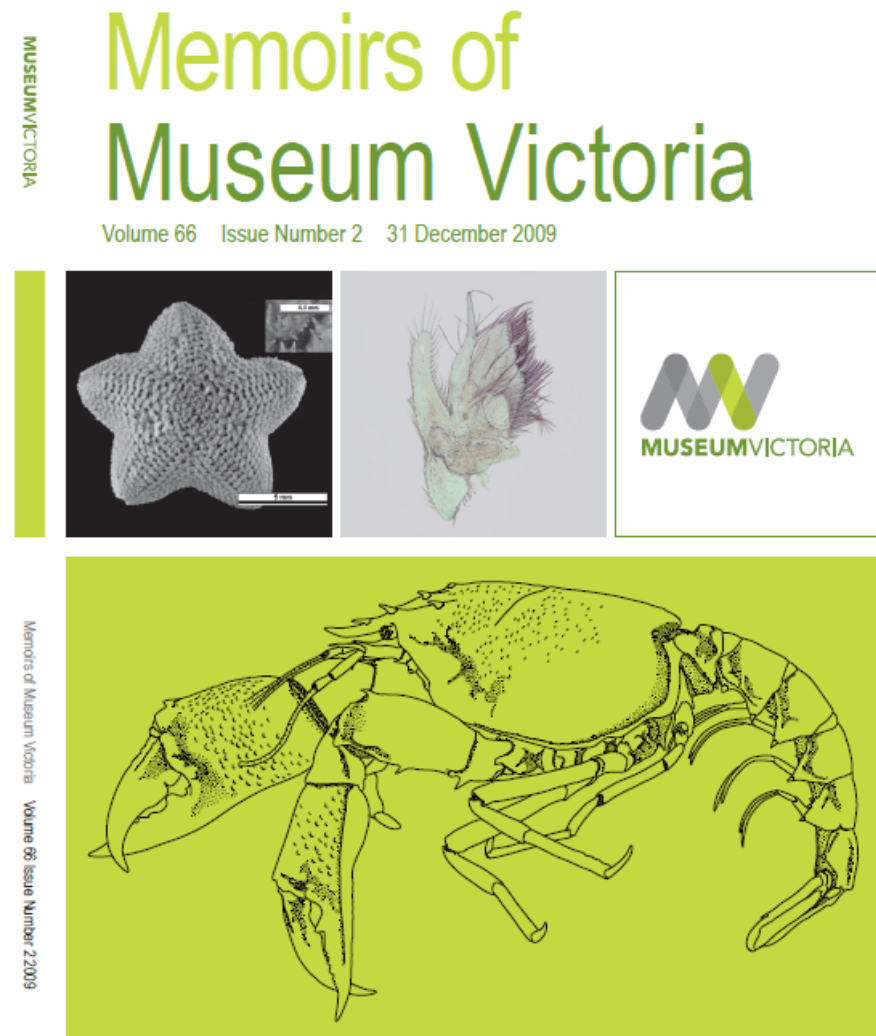
- Search for *Acacia*:
  - 34,688 titles
  - 500+ species
- Search for genus *Carcharias*:
  - 4392 titles
- Historical titles such as:
  - ***Illustrations of Australian plants collected in 1770 during Captain Cook's voyage round the world in H.M.S. Endeavour*** - The Right Hon. Sir Joseph Banks and 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

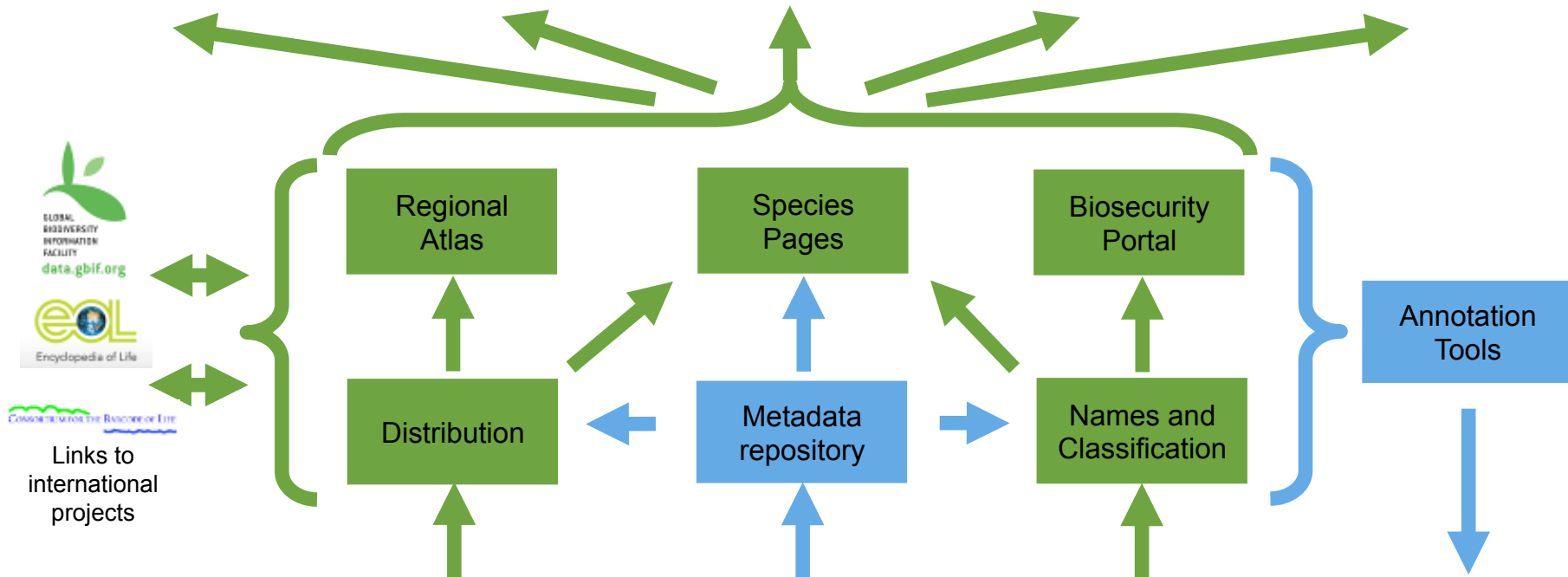
- Already in BHL (at least partially):
  - Proceedings of the Linnean Society of New South Wales
  - Proceedings of the Royal Society of Victoria
  - Proceedings of the Royal Society of Queensland
  - Transactions of the Royal Society of South Australia
  - Transactions of the Royal Society of Victoria
  - 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.)

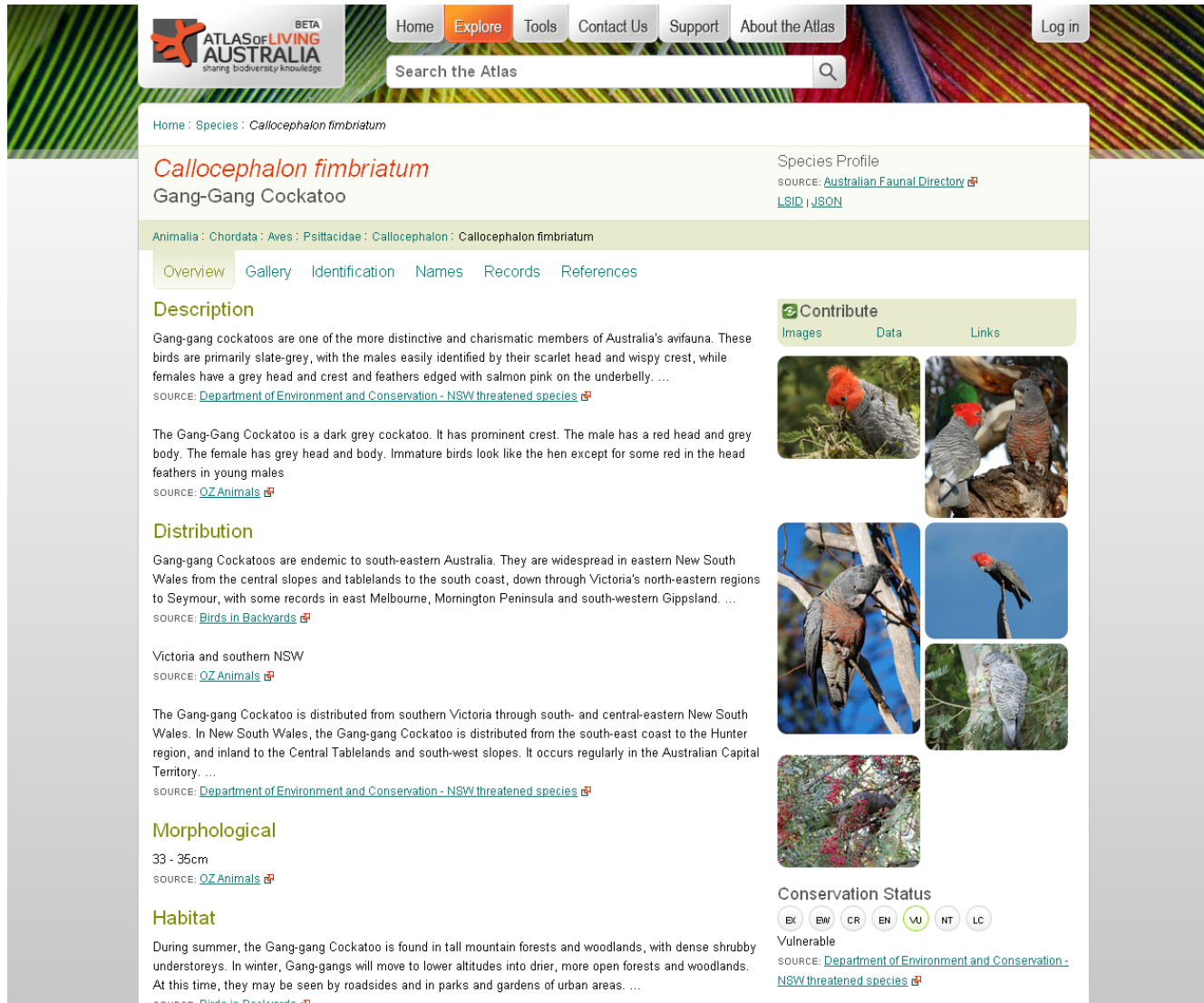


**Metadata** (source, methods, ownership, access, etc.)

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



# Integrating it all Species information



Home | Explore | Tools | Contact Us | Support | About the Atlas | Log in

Search the Atlas

Home : Species : *Callocephalon fimbriatum*

## *Callocephalon fimbriatum* Gang-Gang Cockatoo

Species Profile  
SOURCE: [Australian Faunal Directory](#)

LSID | JSON

Animalia : Chordata : Aves : Psittacidae : Callocephalon : *Callocephalon fimbriatum*

Overview | Gallery | Identification | Names | Records | References

### Description

Gang-gang cockatoos are one of the more distinctive and charismatic members of Australia's avifauna. These birds are primarily slate-grey, with the males easily identified by their scarlet head and wispy crest, while females have a grey head and crest and feathers edged with salmon pink on the underbelly. ...  
SOURCE: [Department of Environment and Conservation - NSW threatened species](#)

The Gang-Gang Cockatoo is a dark grey cockatoo. It has prominent crest. The male has a red head and grey body. The female has grey head and body. Immature birds look like the hen except for some red in the head feathers in young males  
SOURCE: [OZ Animals](#)

### Distribution

Gang-gang Cockatoos are endemic to south-eastern Australia. They are widespread in eastern New South Wales from the central slopes and tablelands to the south coast, down through Victoria's north-eastern regions to Seymour, with some records in east Melbourne, Mornington Peninsula and south-western Gippsland. ...  
SOURCE: [Birds in Backyards](#)

Victoria and southern NSW  
SOURCE: [OZ Animals](#)

The Gang-gang Cockatoo is distributed from southern Victoria through south- and central-eastern New South Wales. In New South Wales, the Gang-gang Cockatoo is distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes. It occurs regularly in the Australian Capital Territory. ...  
SOURCE: [Department of Environment and Conservation - NSW threatened species](#)


### Morphological

33 - 35cm  
SOURCE: [OZ Animals](#)

### Habitat

During summer, the Gang-gang Cockatoo is found in tall mountain forests and woodlands, with dense shrubby understoreys. In winter, Gang-gangs will move to lower altitudes into drier, more open forests and woodlands. At this time, they may be seen by roadsides and in parks and gardens of urban areas. ...  
SOURCE: [Birds in Backyards](#)

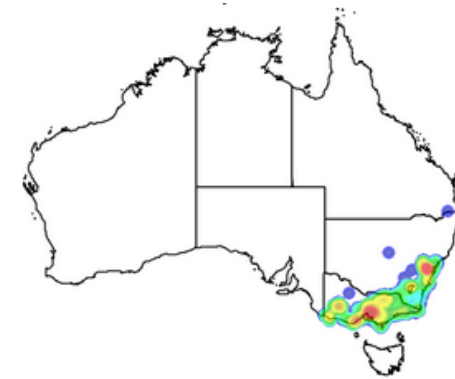
Contribute  
Images | Data | Links



### Conservation Status

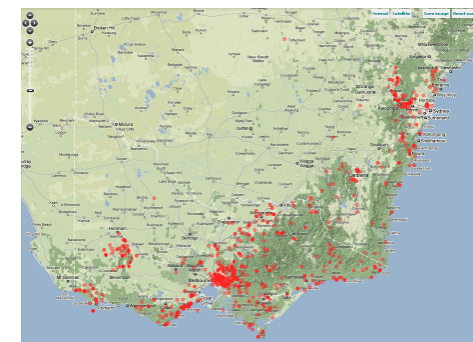
EX EW CR EN **VU** NT LC

Vulnerable  
SOURCE: [Department of Environment and Conservation - NSW threatened species](#)




### 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



BETA  
ATLAS OF LIVING AUSTRALIA  
sharing biodiversity knowledge

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Home : Explore : Your Area

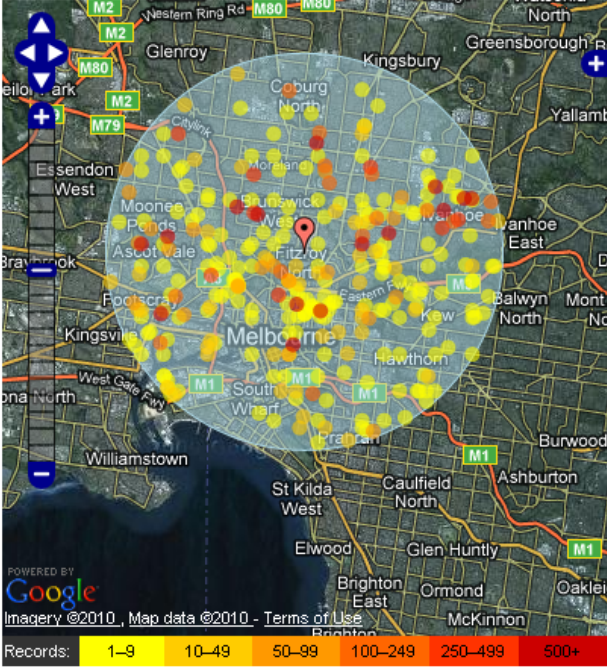
## Explore Your Area

Enter your location or address:

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

Display records in a  km radius


Group	Count	Species	<input type="button" value="Download"/>
<a href="#">All Species</a>	1941	1. <a href="#">Acridotheres tristis</a> - (866 records)	<input type="button" value="Download"/>
<a href="#">Animals</a>	1147	2. <a href="#">Tachybaptus novaehollandiae</a> -	<input type="button" value="Download"/>
<a href="#">Mammals</a>	38	Australasian Grebe (820 records)	<input type="button" value="Download"/>
<a href="#">Birds</a>	283	3. <a href="#">Streptopelia chinensis</a> - Spotted Turtle-	<input type="button" value="Download"/>
<a href="#">Reptiles</a>	28	dove (743 records)	<input type="button" value="Download"/>
<a href="#">Amphibians</a>	13	4. <a href="#">Turdus merula</a> - Common Blackbird	<input type="button" value="Download"/>
<a href="#">Fish</a>	0	(731 records)	<input type="button" value="Download"/>
<a href="#">Insects</a>	365	5. <a href="#">Grallina cyanoleuca</a> - Magpie-lark (721	<input type="button" value="Download"/>
<a href="#">Plants</a>	370	records)	<input type="button" value="Download"/>
<a href="#">Fungi</a>	69	6. <a href="#">Trichoglossus haematodus</a> - Rainbow	<input type="button" value="Download"/>
<a href="#">Chromista</a>	15	Lorikeet (685 records)	<input type="button" value="Download"/>
<a href="#">Protozoa</a>	0	7. <a href="#">Anthochaera carunculata</a> - (682 records)	<input type="button" value="Download"/>
<a href="#">Bacteria</a>	1	8. <a href="#">Sturnus vulgaris</a> - Common Starling	<input type="button" value="Download"/>
		(681 records)	<input type="button" value="Download"/>



Map showing species distribution points around Melbourne, Australia. The map is powered by Google Imagery and includes a legend for record counts: 1-9, 10-49, 50-99, 100-249, 250-499, 500+.

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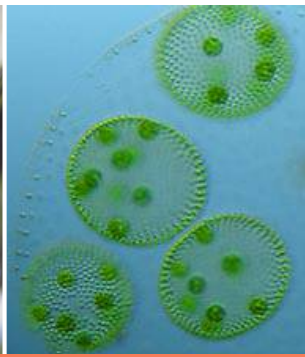


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# How to participate

- Comments, criticisms, concerns
  - Email: Donald Hobern, [Donald.Hobern@csiro.au](mailto:Donald.Hobern@csiro.au)
- Share data through the ALA
  - Email: Miles Nicholls, [Miles.Nicholls@csiro.au](mailto:Miles.Nicholls@csiro.au)
- Use ALA services and tools
  - Email: David Martin, [David.Martin@csiro.au](mailto: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](http://www.ala.org.au)



Tasmanian Museum & Art Gallery



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



ABRS



CSIRO



Australian Government  
Department of Agriculture,  
Fisheries and Forestry



The Council of Heads of Australian  
Faunal Collections (CHAFC)  
The Council of Heads of Australian  
Entomological Collections (CHAEC)



**An Australian Government Initiative**  
**National Collaborative Research**  
**Infrastructure Strategy**

The Council of Heads of Australasian  
Collections of Microorganisms (CHACM)  
The Council of Australasian Museum  
Directors (CAMD)



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