



# Whole-Drawer Digitisation at the Australian National Insect Collection (ANIC).

Nicole Fisher

September 2013

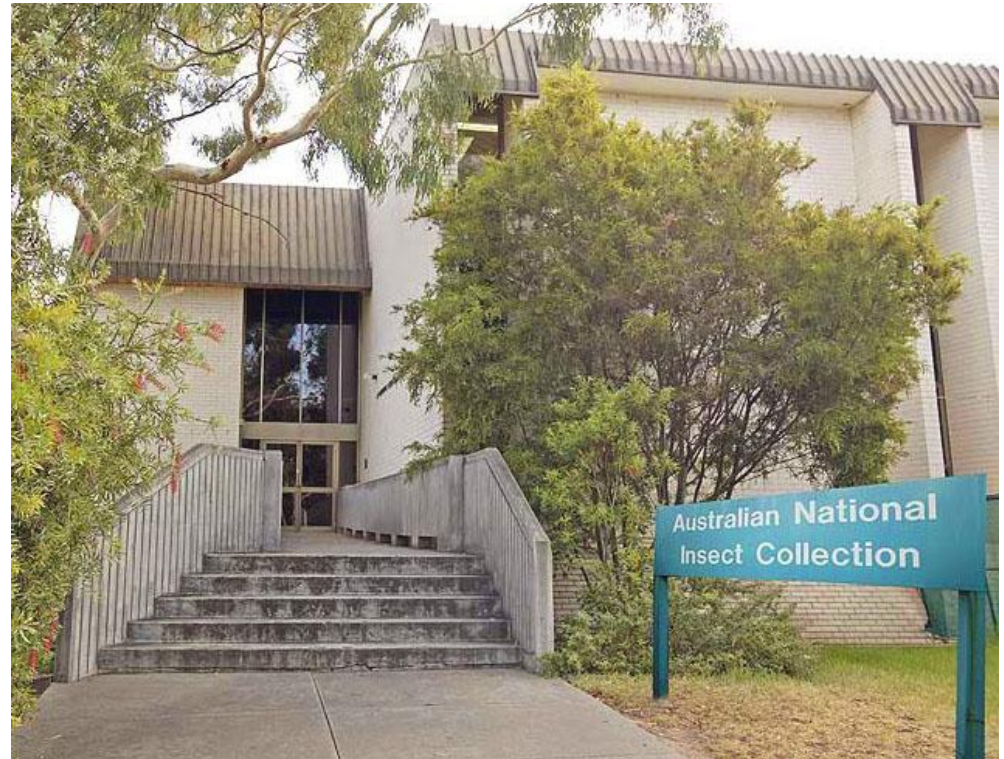
# Section 1: *Introduction*





# Australian National Insect Collection (ANIC)

- ANIC is the world's largest collection of Australian insects and related groups (mites, spiders, earthworms, nematodes & centipedes).
- 12 million insect specimens!  
.... and grow at a rate of 100,000 per year



## Section 1 : Introduction

# Australian National Insect Collection (ANIC)

2,000 cabinets  
(10 drawers per cabinets)  
= 20,000 drawers

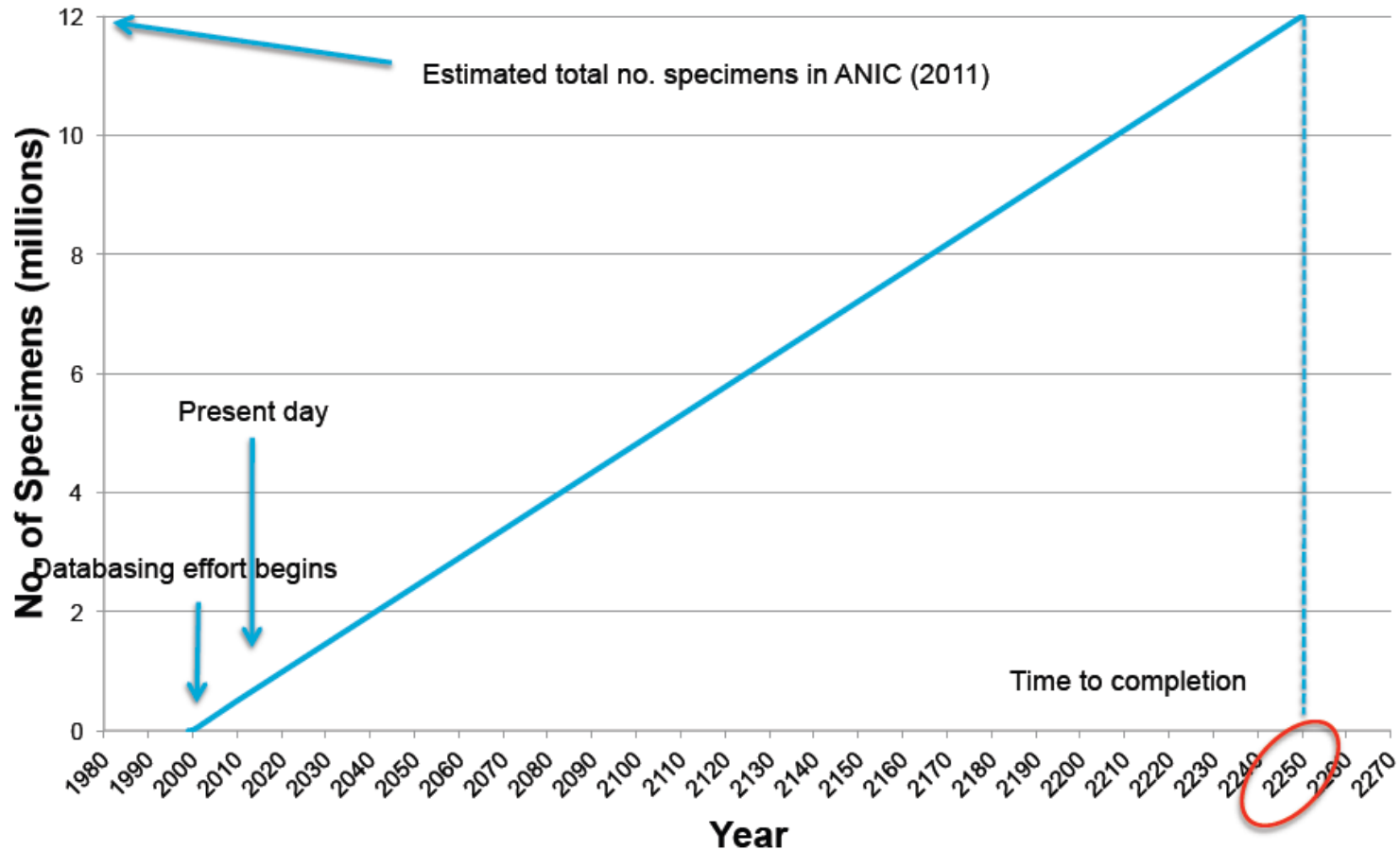
*(To date – about 2,000 drawers are imaged using  
our satscan = 10% of ANIC )*



# Australia's biodiversity

- Australia is home to around 8% of the world's plant and animal species
- Every day we are making new and exciting discoveries about Australia's biodiversity.
- Yet only about 25 % of Australia's species have been formally described.

# Current rate of digitisation at the ANIC



# Why digitise a collection ?

Imaging of a collection enables an enhanced ability to -

- Promote & encourage remote curation of unsorted specimens;
- Deliver insect specimen metadata;
- Assist with image and loan requests;
- Provide a method for auditing the collection;
- Encourage public engagement with biological collections;
- **Permit morphometric analysis of at least some specimens.**

(see : Johnson,L . et al (2013) Morphometric measurements of dragonfly wings: the accuracy of pinned, scanned and detached measurement methods.

ZooKeys 276: 77–84. doi: [10.3897/zookeys.276.4207](https://doi.org/10.3897/zookeys.276.4207))





## Section 1 : Introduction

# Collections digitised and on-line

- Can help when a collection is not accessible.



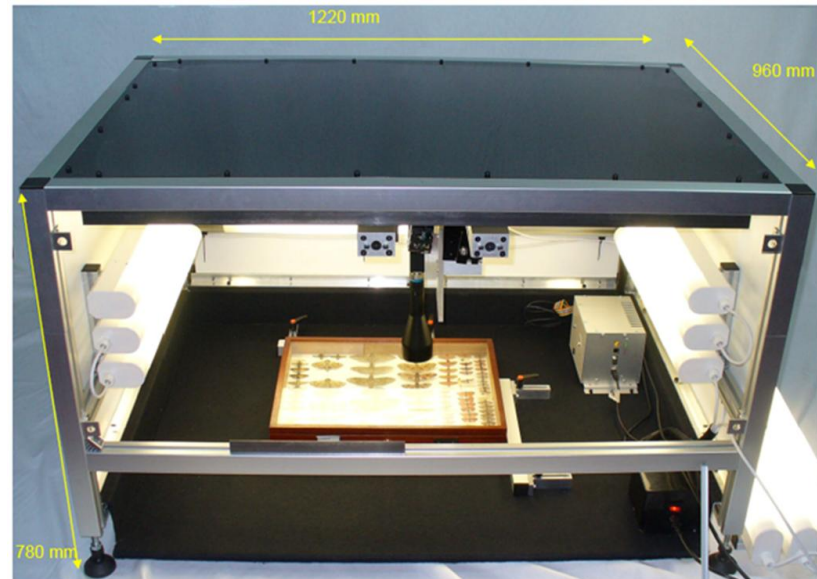


## Section 2:

# *Whole-drawer imaging in ANIC*

# The SatScan™ by SmartDrive Ltd

- a combination of hardware and software
- automatically captures a series of 200-400 “tile” images at precisely monitored positions
- tile images are then assembled together to form a high-resolution final image of a drawer



# Where to begin ...

- How to go about scanning 20,000 drawers ?
- Recruit volunteers ?

**Contact Information :**  
CV's & questions  
post or email to

Nicole Fisher  
Australian National Insect Collection,  
CSIRO Ecosystem Sciences,  
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by May 27th 2011

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Email: nicole.fisher@csiro.au

Volunteer at the  
Australian National Insect Collection  
(ANIC)

**WE WANT YOU**

**Digitisation Volunteer Project :**

- Project is part of national and international initiatives that harness emerging digital technologies to support biodiversity and improve efficiency in taxonomy.
- You will gain experience using photography, scanning equipment, conducting microscope photography, processing images for storage & upload to the internet, and familiarity with methods of managing digital information.
- Project will take place between June and December 2011.

**Volunteer with Us !**



## Section 3 : Whole-drawer imaging in ANIC

# We couldn't do it without ..



Our Volunteers...

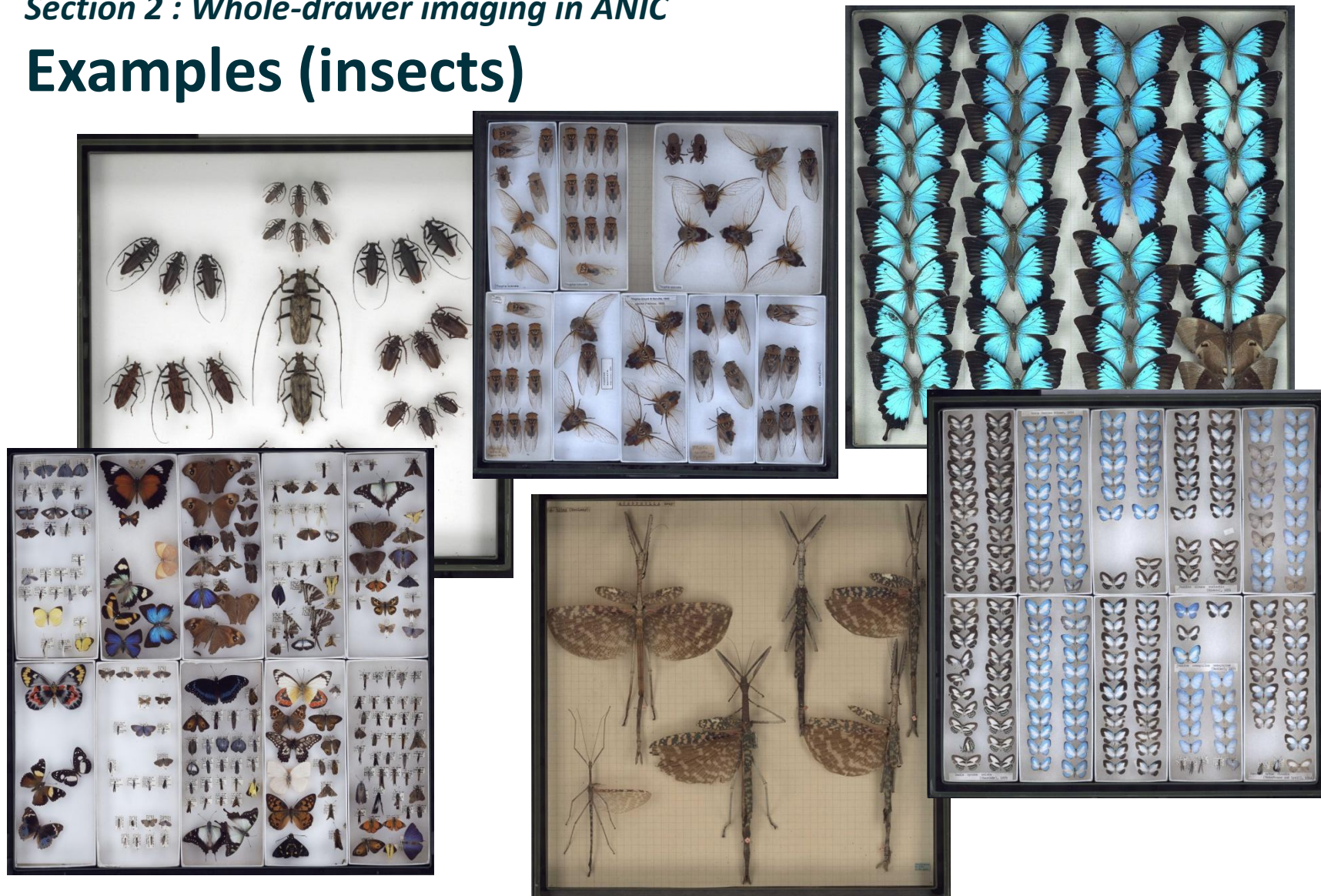


Our Hero's!



## Section 2 : Whole-drawer imaging in ANIC

# Examples (insects)





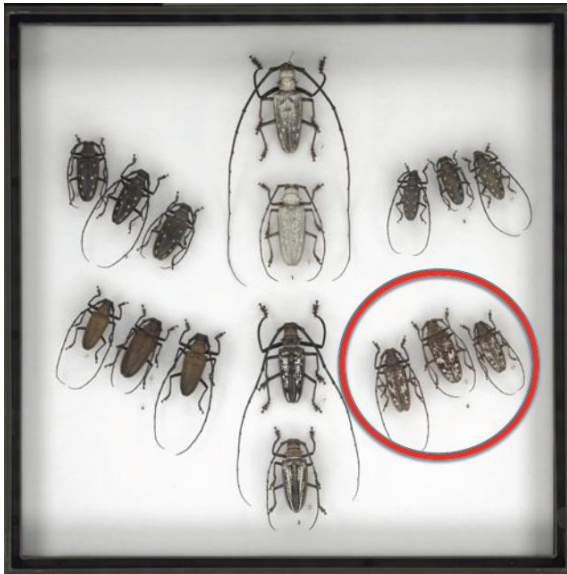
## Section 2 : Whole-drawer imaging in ANIC

# Examples (non-insects)

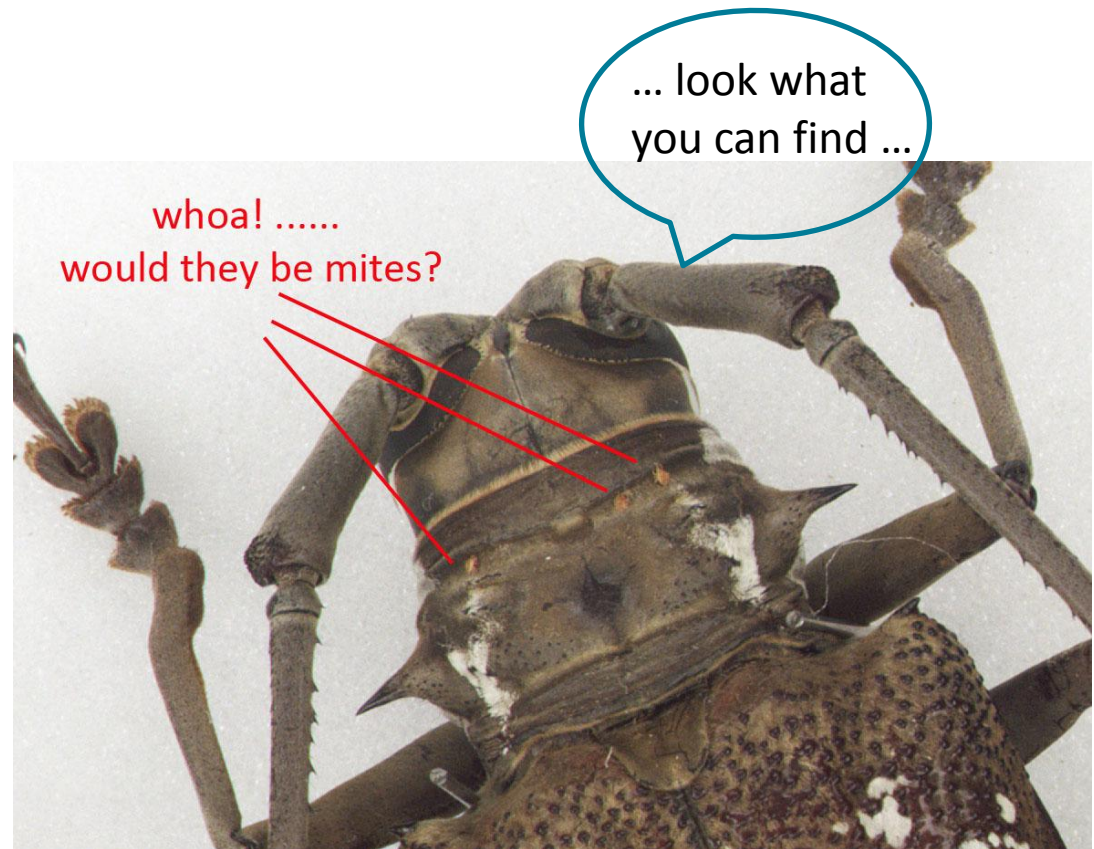




# High resolution images



Leads to unexpected discoveries



# High resolution images

- And more unexpected discoveries ...
- Did anyone know about this ?



# Challenges

- **Development of workflow:**
  - Drawer image is out-of-date immediately after capture.
  - Maintain list of drawers that have 'changed' due to sorting, curation, changes to agreed taxonomy etc.
- **Metadata capture and handling:**
  - Linking images with specimens: Morphbank, LSIDs?
  - Interacting with & annotating image metadata.
  - Integration with collection management system.
  - Image storage (25,000 drawers = 12TB).
- **System limitations:**
  - Scanning area ~ 500 x 600 mm.
  - Errors during batch stitching.
  - Focusing is time consuming and clumsy.



## Section 2 : Whole-drawer imaging in ANIC

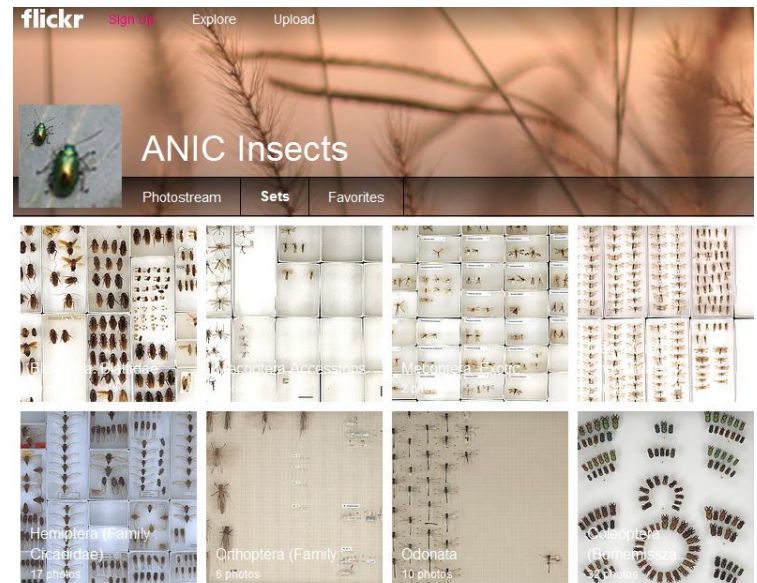
# Delivery of whole drawer images on-line

- To Morphbank (ALA node) ...  
(but issues with this)

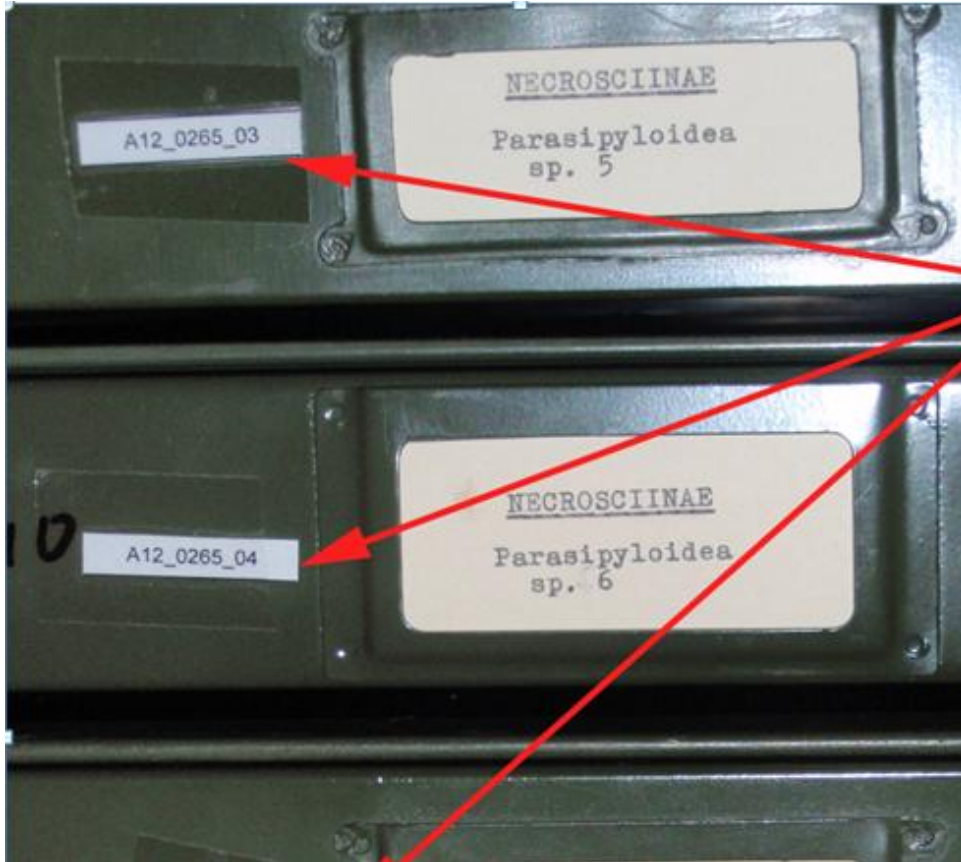
- So we do use flickr

(as a quick & easy way for external researches to look at drawers)

	B	C	D	E	F	G	H	I	J	K	L	M
1	Image External id	Image External id	Original File Name	Create Com				Image Description				Specimen External id
1025	98000939-1	ANIC-1	A12_0274_10_01.tiff		CSIRO			ANIC, Orthoptera drawer - Arrolla				98000939-1
1026	98000940-1	ANIC-1	A12_0276_01_01.tiff		CSIRO			ANIC, Orthoptera drawer - Orthoptera				98000940-1
1027	98000941-1	ANIC-1	A12_0276_02_01.tiff		CSIRO			ANIC, Orthoptera drawer - Orthoptera				98000941-1
1028	98000942-1	ANIC-1	A12_0276_03_01.tiff		CSIRO			ANIC, Orthoptera drawer - Orthoptera				98000942-1
1029	98000943-1	ANIC-1	A12_0276_04_01.tiff		CSIRO			ANIC, Orthoptera drawer - Orthoptera				98000943-1
1030	98000944-1	ANIC-1	A12_0276_05_01.tiff		CSIRO			ANIC, Orthoptera drawer - Orthoptera				98000944-1
1031	98000945-1	ANIC-1	A12_0276_06_01.tiff		CSIRO			ANIC, Orthoptera drawer - Orthoptera				98000945-1
1032	98000946-1	ANIC-1	A12_0276_07_01.tiff		CSIRO			ANIC, Orthoptera drawer - Orthoptera				98000946-1
1033	98000947-1	ANIC-1	A12_0276_08_01.tiff		CSIRO			ANIC, Orthoptera drawer - Orthoptera				98000947-1
1034	98000948-1	ANIC-1	A12_0276_09_01.tiff		CSIRO			ANIC, Orthoptera drawer - Orthoptera				98000948-1
1035	98000949-1	ANIC-1	A12_0276_10_01.tiff		CSIRO			ANIC, Orthoptera drawer - Orthoptera				98000949-1
1036	98000950-1	ANIC-1	A12_0277_01_01.tiff		CSIRO			ANIC, Orthoptera drawer - Gryllacrididae				98000950-1
1037	98000951-1	ANIC-1	A12_0277_02_01.tiff		CSIRO			ANIC, Orthoptera drawer - Xanthogryllacris				98000951-1
1038	98000952-1	ANIC-1	A12_0277_03_01.tiff		CSIRO			ANIC, Orthoptera drawer - Unsorted Orthoptera				98000952-1
1039	98000953-1	ANIC-1	A12_0277_04_01.tiff		CSIRO			ANIC, Orthoptera drawer - Unsorted Orthoptera				98000953-1
1040	98000954-1	ANIC-1	A12_0277_05_01.tiff		CSIRO			ANIC, Orthoptera drawer - Unsorted Orthoptera				98000954-1
1041	98000955-1	ANIC-1	A12_0277_06_01.tiff		CSIRO			ANIC, Orthoptera drawer - Gryllacris rufovana				98000955-1
1042	98000956-1	ANIC-1	A12_0277_07_01.tiff		CSIRO			ANIC, Orthoptera drawer - Gryllacrididae				98000956-1
1043	98000957-1	ANIC-1	A12_0277_08_01.tiff		CSIRO			ANIC, Orthoptera drawer - Unsorted Orthoptera				98000957-1
1044	98000958-1	ANIC-1	A12_0277_09_01.tiff		CSIRO			ANIC, Orthoptera drawer - Orthoptera				98000958-1
1045	98000959-1	ANIC-1	A12_0277_10_01.tiff		CSIRO			ANIC, Orthoptera drawer - Macropathinae				98000959-1
1046	98000960-1	ANIC-1	A05_0118_10_01.tiff		CSIRO			ANIC, Orthoptera drawer - Oedaleus australis				98000960-1
1047	98000961-1	ANIC-1	A05_0119_01_01.tiff		CSIRO			ANIC, Orthoptera drawer - Oedaleus australis				98000961-1
1048	98000962-1	ANIC-1	A05_0119_02_01.tiff		CSIRO			ANIC, Orthoptera drawer - Orthoptera				98000962-1
1049	98000963-1	ANIC-1	A05_0119_03_01.tiff		CSIRO			ANIC, Orthoptera drawer - Orthoptera				98000963-1
1050	98000964-1	ANIC-1	A05_0119_04_01.tiff		CSIRO			ANIC, Orthoptera drawer - Heteroptermis obscurella				98000964-1
1051	98000965-1	ANIC-1	A05_0119_05_01.tiff		CSIRO			ANIC, Orthoptera drawer - Heteroptermis obscurella				98000965-1
1052	98000966-1	ANIC-1	A05_0119_06_01.tiff		CSIRO			ANIC, Orthoptera drawer - Heteroptermis obscurella				98000966-1



## Keeping track of drawers and images



- Drawer name =  
location code for the drawer =  
filename of the image
- Human readable – some benefits :  
Easier for our volunteers & staff  
to help with digitisation activities
- We haven't yet moved to  
machine readable

# Colour control sample

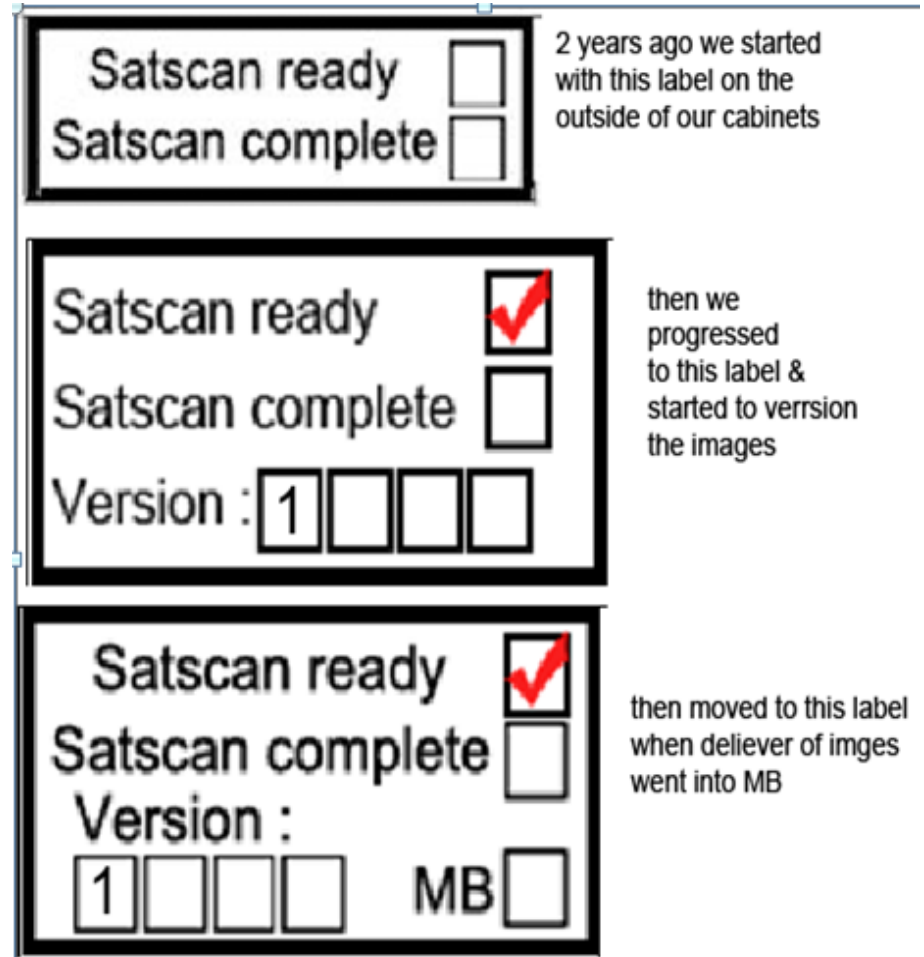
ANIC drawer with a modified photographic colour control sample





# Labelling of cabinets

- Different labels we have used over the years to identify which cabinets have been scanned and imaged
- Labels are situated on the outside of cabinets



## Section 3:

*Next step –*

*value adding to our research*

## Section 3: Next step – value adding to our research

# The Euryglossa bee project

- Not much of ANIC specimen label data is capture in a digital format contained in our database

- So how to go about getting this information

- We use our whole-drawer technology and crowd sourcing techniques



The screenshot shows the ATLAS OF LIVING AUSTRALIA website interface. The header includes the logo and navigation links like 'Home | Logout' and a search bar. The main content area displays a 'Transcribe Task: Australian National Insect Collection - Euryglossinae Bee Expedition 1: (ID: BVP\_32-022515.jpg)'. Below the task title is a 'Create Forum Topic' button. A blue notification bar states: 'This task has been validated, and is currently read-only. As a validator you may review/edit this task by clicking here.' Below this are links for 'Specimen Label tutorial' and 'ANIC Bees tutorial supplement'. The central image shows a specimen label for *Euryglossa nigrocaerulea* Cockerell, 1913, with handwritten details: 'ANIC Database No. 32 022515', 'Hastings, Tas. 15 Jan. 49', 'E.F. Riek', and 'Euryglossa (Euryglossa) nigrocaerulea Cockerell Det. E. M. Exley 1975'. To the right of the image is a 'Specimen Information' form with fields for Institution (ANIC), Project (Australian National Insect Collection - Euryglossinae Bee Expedition 1), Catalogue No. (32-022515), and Taxa (Euryglossa nigrocaerulea). Below the form is a 'Copy values from a previous task' button and a '1. Transcribe All Text' instruction. The form fields are populated with the specimen's details.

# The Euryglossa bee project

<http://collections.ala.org.au/public/showDataResource/dr897>

- On the ALA website we can access the data from each project

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▶ [Euryglossinae Bee Expedition 1](#)

Type of resource: records License: other License version: [View records](#)

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▶ [Euryglossinae Bee Expedition 2](#)

Type of resource: records License: other License version: [View records](#)

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▶ [Plume moths - ANIC](#)

Type of resource: records License: other License version: [View records](#)

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# The Euryglossa bee project

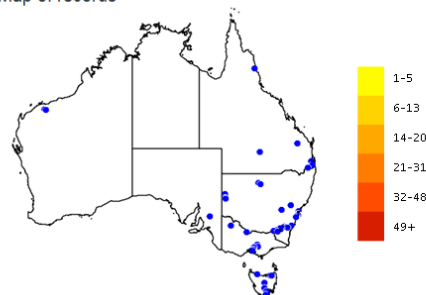
- Graphical data is available for our use

## Digitised records

280 records can be accessed through the Atlas of Living Australia. This resource was last checked for updated data on 04 Jul 2013. The most recent data was published on 04 Jul 2013.

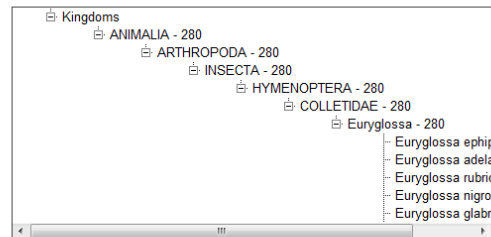
[Click to view records for the Euryglossinae Bee Expedition 1 resource.](#)

## Map of records

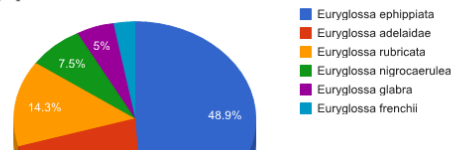


[Learn more about Atlas maps](#) \*

## Explore records by taxonomy



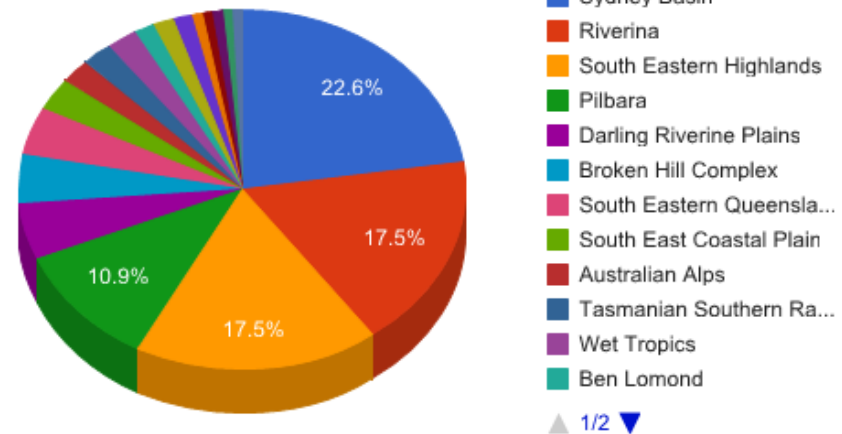
## By species



# The Euryglossa bee project

- Now that the information from the specimen label has been turned into a digital format, we can derive more information than even before

By biogeographic region



# Section 4:

*Where to next ..... ?*

# ANIC's future plans

- Image repository.
- Integration with a collection management system.
- Barcodes on unit trays & drawers to link images with metadata.



## Section 4 : Where to next ..... ?

# Examples of virtual collections

- NSW State Library :

<http://www.sl.nsw.gov.au/events/exhibitions/2012/lewin/collectionviewer/index.html>

- Google Art Project :

<http://www.googleartproject.com/collection/art-gallery-of-new-south-wales/museumview/>

- WebGL Bookcase

<http://workshop.chromeexperiments.com/bookcase/>



Browsing for books on WebGL Bookcase

# Thank you

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[www.csiro.au](http://www.csiro.au)

