Atlas of Living Australia
Year in Review
2021-22

Azure Kingfisher *(Ceyx azureus)*
David White

NCRIS
National Research
Infrastructure for Australia
An Australian Government Initiative

CSIRO

Atlas of Living
Australia
ala.org.au

Southern Brown Bandicoot
(Isoodon obesulus)
Michael Keogh

Spectacled Flying Fox
(Pteropus conspicillatus) kcomeau

Director's overview

It's a pleasure to welcome you to the Atlas of Living Australia (ALA) Year in Review 2021–22, in which we showcase our achievements and reflect on the significant contributions made by our partners in supporting our mission.

This year we were pleased to see the **Australian Government** release the **2021 National Research Infrastructure Roadmap** which identifies future needs and priorities for research infrastructure investment in Australia. This is a fundamental strategy-setting process for the ALA, our partners in the National Collaborative Research Infrastructure (NCRIS) program, and the many thousands of researchers and other users that benefit from this capability. Of interest to our sector was the prominence of the role of collections as one of five proposed step changes in the roadmap which represents a significant opportunity moving forward. To support our involvement and engagement in the roadmap process, the **ALA Decadal Growth for Impact Vision** was also released in 21/22. The vision has been developed to extend and grow ALA's impact beyond the current **Strategy 2020-2025** and is framed around a set of principles and growth opportunities.

The success of the ALA as a national biodiversity data infrastructure rests so much on the contribution made by our data partners. Data in the ALA comes from biological collections, museums and herbaria, state government, major research programs, non-government organisations and increasingly citizen scientists. With this context in mind, a particular highlight for me was the launch of the **ALA Australian Biodiversity Data Mobilisation program** to support the digitisation and databasing of biodiversity data, particularly rare, historical or biodiversity records not already well represented in the ALA. I look forward

to tracking how these projects progress in 22/23 and contribute to Australia's biodiversity data ecosystem. This year also saw the 5-yearly release of the National State of the Environment (SoE) Report which again highlighted the primacy of data to support effective science and decision-making. The ALA was proud to play an active role in supporting this important national environmental reporting program and partnering with our colleagues in the NCRIS program through the **EcoAssets project**. The SoE report highlights the challenges confronting Australian biodiversity management and science, but also provides evidence of the importance of national research infrastructure in supporting this fundamental work.

I'd like to finish by thanking our team who in partnership with our data partners both institutional and individual, are so fundamental to delivering on our mission. The last year has been a year of significant team growth in the ALA, and we now have staff in 6 capital cities working with our partners, projects and supporting our applications and systems. This distributed national model does offer new opportunities for engagement so I encourage you to reach out if we can further support your work.
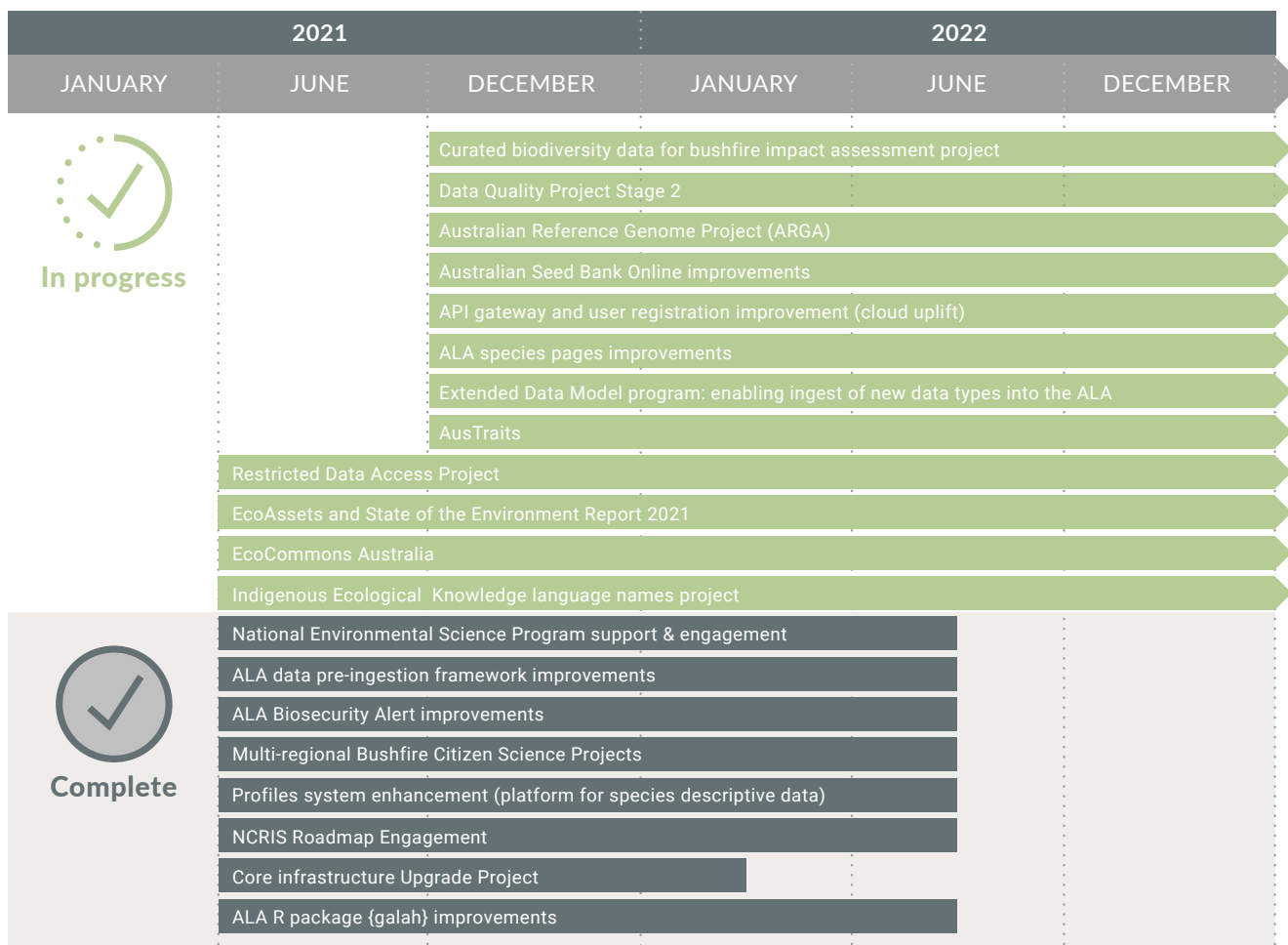
We hope you enjoy reading our 2021–22 story as much as we've enjoyed telling it.

**Dr Andre Zerger,
ALA Director**

How are we tracking?

Checking in with our work plan

Our annual work plan details the projects, activities and major investments planned to deliver on the strategic priorities outlined in the ALA Strategy 2020-25. The table below shows key activities the ALA team worked on during 2021-22. You can view our full annual work plan on our website **ala.org.au/publications.**

	2021			2022		
JANUARY	JUNE	DECEMBER	JANUARY	JUNE	DECEMBER	

In progress

- Curated biodiversity data for bushfire impact assessment project
- Data Quality Project Stage 2
- Australian Reference Genome Project (ARGA)
- Australian Seed Bank Online improvements
- API gateway and user registration improvement (cloud uplift)
- ALA species pages improvements
- Extended Data Model program: enabling ingest of new data types into the ALA
- AusTraits
- Restricted Data Access Project
- EcoAssets and State of the Environment Report 2021
- EcoCommons Australia
- Indigenous Ecological Knowledge language names project

Complete

- National Environmental Science Program support & engagement
- ALA data pre-ingestion framework improvements
- ALA Biosecurity Alert improvements
- Multi-regional Bushfire Citizen Science Projects
- Profiles system enhancement (platform for species descriptive data)
- NCRIS Roadmap Engagement
- Core infrastructure Upgrade Project
- ALA R package {galah} improvements

For more details, visit **ala.org.au/publications**

Work plan highlights across 2022

Australian Biodiversity Data Mobilisation Program

This year we launched the ALA Australian Biodiversity Data Mobilisation Program. This annual grant program provides funds to people and institutions to digitise their biodiversity data and increase accessibility.

Submissions were assessed by an expert panel consisting of members from the Royal Botanic Gardens Victoria, The Western Australia Department of Biodiversity, Conservation and Attractions, CSIRO and the University of New South Wales.

One of the program recipients was Sally South of South Australia Museum (SAM), who is using the grant to mobilise the SAM's Australian Biological Tissues Collection of 39 donated frozen tissue collections of Australian freshwater fishes (around 90% of all known species and ~46,000 records).

> **" Many years of collaborative work between several fish-focused researchers has resulted in a large number of un-logged voucher specimens being stored at the South Australian Museum. With the help of the Data Mobilisation Grant from the Atlas of Living Australia, we are looking forward to working through these stored tissues, identifying and databasing them then uploading the data so that the information is available for everyone.**
>
> - Sally South - Collection Manager, Australian Biological Tissue Collection South Australian Museum

Butterfly collection
📷 CSIRO Australian National Insect Collection
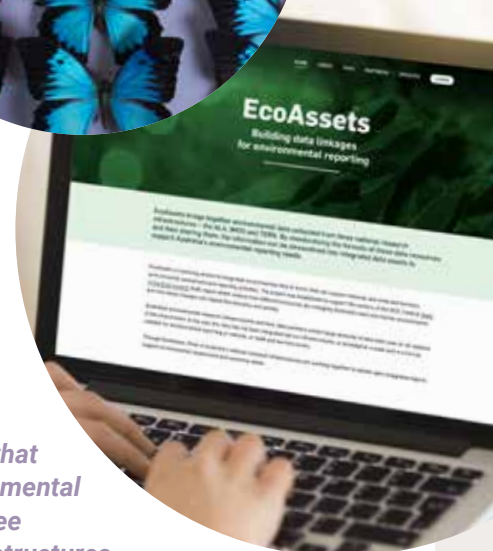
EcoAssets

In June 2022, we launched a new collaborative platform that brings together environmental data collected from three national research infrastructures – the ALA, IMOS and TERN.

Through EcoAssets, data resources from ALA, IMOS and TERN are standardised and shared. The information is also streamlined into integrated data assets to support Australia's environmental reporting needs.

The project was established to support the authors of the 2021 Australian Government State of the Environment (SoE) report. The SoE report is produced every five years to assess how different pressures are changing Australia's land and marine environments and how these changes will impact the economy and society. The authors require access to large high-quality biodiversity and environmental datasets to conduct the analysis. EcoAssets supports this need providing national, aggregated and standardised biodiversity and environmental datasets.

The datasets used in the 2021 SoE report are now publicly and freely accessible via EcoAssets. There are seven summary datasets now available and more will be created in the future.

For more details, visit **ala.org.au/current-projects**

Atlas of Living Australia 2021–22 in numbers

Total metrics (as at 30 June 2022)

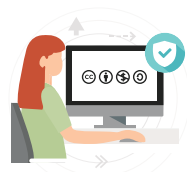**112,154,940**
Total species occurrence records

848
Total number of data sets

>846
Data partners: across research, government and community groups

99.9%
Total number of records under Creative Commons licenses

1,680,977
Species with the most records in the ALA: Australian Magpie (*Gymnorhina tibicen*)

International instances of ALA infrastructure:
19 live including ALA,
8 in development, **7** in discussion, **7** currently offline

Annual metrics

108,262
Total number of ALA registered users

28
Data sets added 2021-22
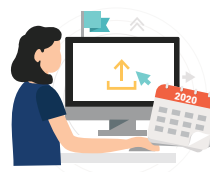
19,653,635
Records first loaded 2021-22

388,169
Most recorded species for 2021-22: Australian Magpie (*Gymnorhina tibicen*)

581
Total publications referencing the ALA in the 2021 calendar year, **466** of which are journal articles

8,365
Number of Galah (R package) downloads

Australian Magpie *(Gymnorhina tibicen)*
📷 Matt Campbell

Annual User Satisfaction Survey

In May 2022, we ran the first of our annual user satisfaction surveys to help inform reporting for NCRIS and to deliver ongoing improvements to the ALA.

Survey highlights:

80% of users said that they were satisfied with the ALA

84% of users said that they would recommend the ALA to a colleague or friend

Of those who said they used the ALA for research:

89% said that the ALA had improved their research quality

Survey respondents:
704

It's the only site available that I know of with such a breadth of data.

I don't know of any other 'one stop shop' for species data in Australia.

It is an excellent and unique resource, access to which is very flexible.

What were the affiliations of survey respondents?

From the survey, 50% of respondents were individuals, 13% were from Community, Conservation or First Nations Organisations, 11% were Government and 10% were research. Other affiliations recorded from survey respondents were Education, Industry/Commercial and Collections.

Atlas of Living Australia 2021–22 in numbers (continued)

Research impact metrics

In 2020, we released a new online bibliography. It lists known journal articles, books, websites etc that cite data in the ALA or ALA infrastructure.
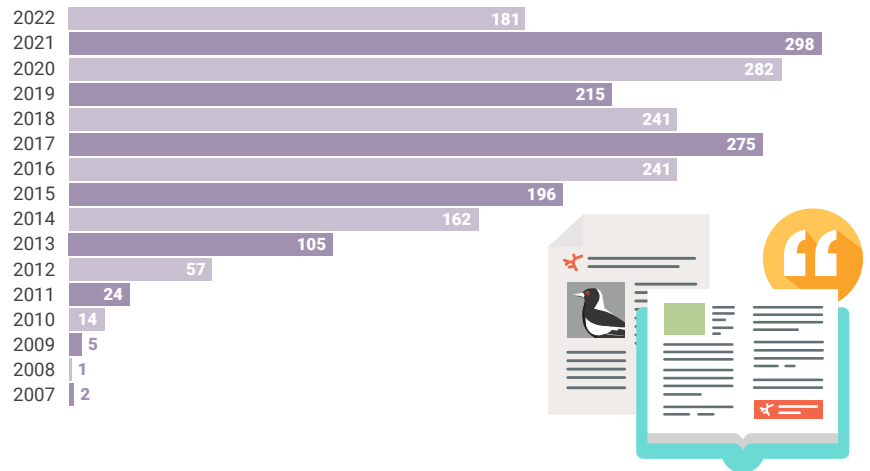
You can browse or search the publication list and also let us know how you have used the ALA. **ala.org.au/ala-cited-publications**

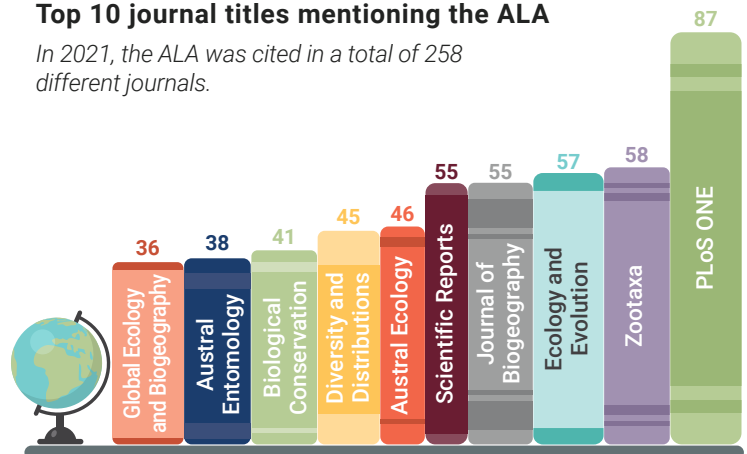Crested Katydid *(Alectoria superba)* via iNaturalist ⚙ Third Silence Photography

Annual number of journal articles citing the ALA

Between the 2020 and 2021 calendar years, we saw a 3% increase in the number of journals citing the ALA.

Year	Articles
2022	181
2021	298
2020	282
2019	215
2018	241
2017	275
2016	241
2015	196
2014	162
2013	105
2012	57
2011	24
2010	14
2009	5
2008	1
2007	2

Top 10 journal titles mentioning the ALA

In 2021, the ALA was cited in a total of 258 different journals.

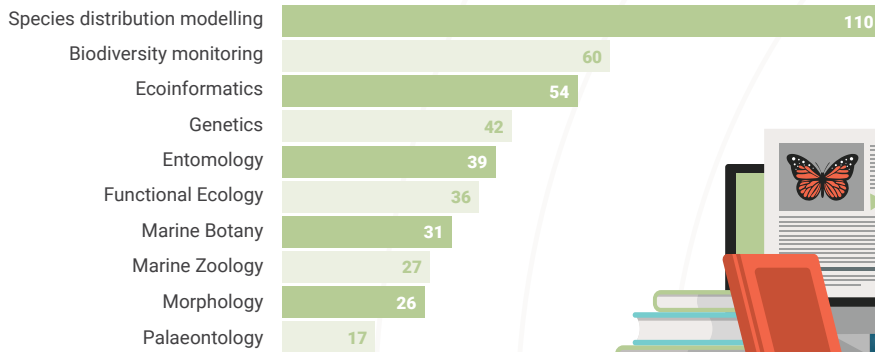| Journal	Count
Global Ecology and Biogeography	36
Austral Entomology	38
Biological Conservation	41
Diversity and Distributions	45
Austral Ecology	46
Scientific Reports	55
Journal of Biogeography	55
Ecology and Evolution	57
Zootaxa	58
PLoS ONE	87

Fly Agaric Fungus
(Amanita muscaria) 📷 R. Reiner

Research domains citing the ALA

The ALA is used by researchers across many different research domains from ecoinformatics and taxonomy as well as education, social science and the arts.

Research domain	Count
Species distribution modelling	110
Biodiversity monitoring	60
Ecoinformatics	54
Genetics	42
Entomology	39
Functional Ecology	36
Marine Botany	31
Marine Zoology	27
Morphology	26
Palaeontology	17

Launch of ALA Labs

ALA's newest capability, **ALA Labs,** provides our users with technical know-how and detailed solutions to specific scientific problems using our data. Most ALA labs articles feature galah our #rstats package that provides a set of tools to use within R.
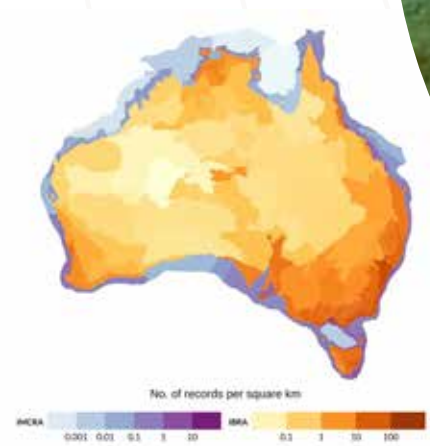
This map shows the number of plant records per square kilometre held in the ALA in each terrestrial and marine bioregion. To find out how to recreate this, visit ALA Labs labs.ala.org.au

No. of records per square km

IMCRA 0.001 0.01 0.1 1 10   IBRA 0.1 1 10 100

Leafy Seadragon *(Phycodurus eques)* 📷 Martin

Delivering data: from our data partners to your desktop

We harmonise more than 800 datasets from many different data providers across museums, collections and herbaria, universities, science organisations, government departments, Indigenous communities, industry and community groups.

Data in the ALA

Top data providers by occurrence record count

| eBird Australia **32.4m** | Bird Life Australia **15.1m** | NSW Dept of Planning, Industry and Environment **12.9m** | Victorian Biodiversity Atlas **8.3m** | Australasian Virtual Herbarium **6.9m** | Online Zoological Collections of Australian Museums (OZCAM) **5.3m** | Ocean Biodiversity Information System (OBIS) **4.7m** |

Basis of record

- Preserved specimen **13.9m**
- Machine observation **1.7m**
- Environmental DNA **1.2m**
- Other **2.7m**
- Human observation **77.5m**
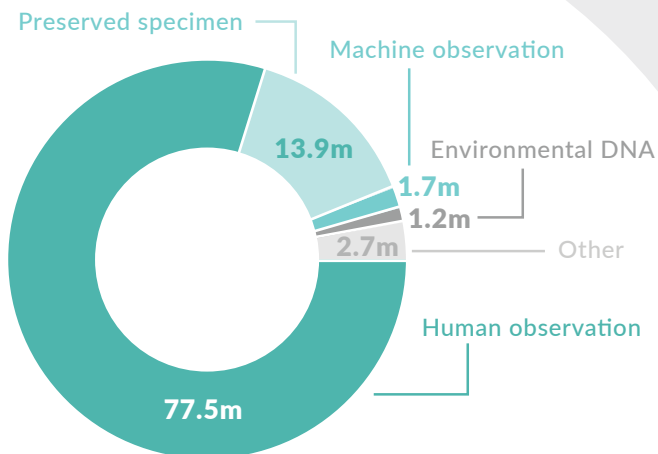
Occurrence records by state and territory

- NT 5%
- NSW 28%
- ACT 4%
- QLD 17%
- SA 10%
- TAS 4%
- VIC 24%
- WA 8%
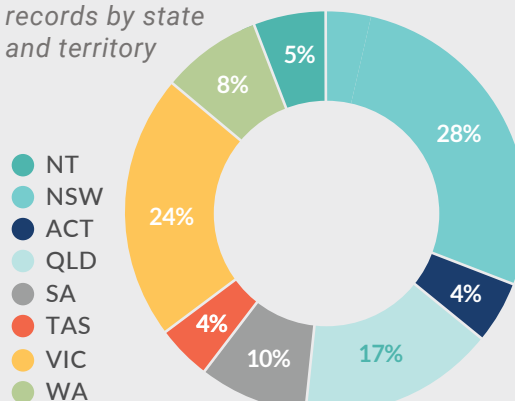
Data partner spotlight

FrogID

The FrogID database hosted by the Australian Museum has been shared with the ALA for three consecutive years. It is a huge, unprecedented resource for researchers, land-managers and anyone interested in learning more about Australia's unique frogs. In the first three years of the FrogID project, more than 16,000 people used the FrogID app to record the calls of 204 frog species, resulting in more than 272,000 biodiversity records of frogs. This represents around one third of all frog records on ALA and demonstrates the power of citizen science in gathering rapid scientific information to help inform conservation.

" FrogID data is already helping us understand frog species' richness, the true distribution of frogs across Australia, which species are best equipped to survive the human world, and how the Black Summer 2019/2020 bushfires impacted our frogs. The FrogID project is a national initiative like no other, hosted by the Australian Museum, it is working to rapidly gather the scientific data researchers and land-managers need to better understand and conserve Australia's unique frogs and ecosystems.

Were it not for the collective efforts of thousands of FrogID citizen scientists across the country, Australia would have 270,000 fewer records on ALA contributing to frog ecology and conservation.

- Nadiah Roslan, FrogID Project Coordinator, Australian Museum Research Institute

Screaming Tree Frog *(Litoria quiritatus)* 📷 Darkes Forest Rowley2

" ALA has provided ground-breaking infrastructure and services that have been critical in sharing our biodiversity data to wide audiences."

- Matt Miles, Science and Information Branch

Dunnart *(genus Sminthopsis)* 📷 SA Department for Environment and Water

South Australia Government

South Australia's Department for Environment and Water considers the ALA a key part of its biodiversity data ecosystem. It supports data capture through BioCollect and DigiVol, makes observation data from its biological survey and monitoring datasets available to local and global audiences, and provides important data validation tools via Sandbox and annotation services.

Lord Howe Moray Eel *(Gymnothorax annasona)* via iNaturalist 📷 Steve Smith

Our data partners: highlights for 2021–22

Biodiversity Heritage Library

BHL Australia is a national project working to digitise Australia's biodiversity heritage literature and make it freely available and discoverable online. It is funded by, and operates as a co-investment between, Museums Victoria and the ALA.

38 contributing organisations across Australia (1 new in 2021–22)

427,234 pages of Australia's biodiversity literature openly accessible online (34,544 added in 2021–22)

283,108 page views (70,625 in 2021–22)

110,174 individual users (23,144 in 2021–22)

DigiVol

Digivol enables volunteers to capture data and digitise collections held within museums, libraries, archives and herbaria. It is managed by the Australian Museum and powered by the ALA.

11,490 volunteers

12,702,936 transcriptions

30% increase in transcriptions from the year before

iNaturalist Australia

The ALA manages the Australian node of iNaturalist – the world's leading social network for biodiversity. iNaturalist Australia uses community expertise and image recognition to help users identify species and share observations.

48,726 observers

3.73 Million observations

45,271 identified species

As at 1 July 2022 for Australian stats

Purple Tassels *(Sowerbaea laxiflora)*
via iNaturalist 📷 Possumpete

International Living Atlases

Software code originally developed by our Australian team is now in use by countries around the world to help manage their national biodiversity databases. The network of biodiversity data infrastructures is called the Living Atlases community.

19 live instances including ALA (4 currently offline)

11 instances in development

7 instances in discussion

Australasian Virtual Herbarium

The AVH provides access to collection data for plant, algae and fungi specimens held in Australian and New Zealand herbaria. It is powered by the ALA.

13 herbaria that provide data

6.9 Million records

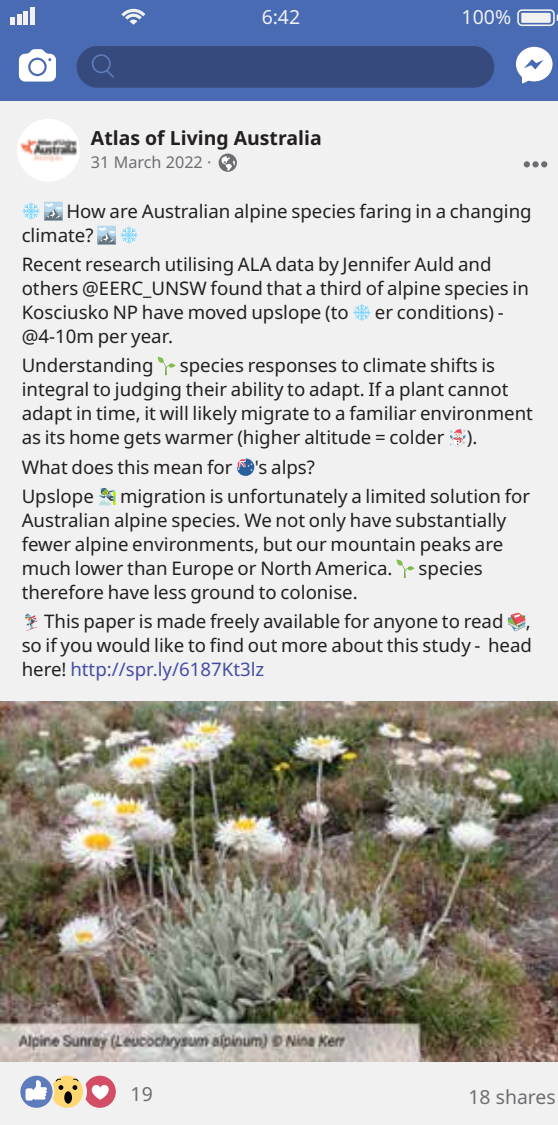## MERIT

Australian Government

MERIT is the Department of Climate Change, Energy, the Environment and Water's (DCCEEW) online reporting tool and is powered by the ALA. It is used to collect and store planning, monitoring and reporting data associated with natural resource management grants projects funded by the Australian Government.

834 projects

13 programs

36 subprograms

Delivering trusted data for research

This year we packaged up ALA research case studies into bite-sized stories for social media.. All stories were posted to our ALA Twitter and Facebook channels.

Here are a few of our favourites...

Atlas of Living Australia
31 March 2022 · 🌐

❄️ How are Australian alpine species faring in a changing climate? ❄️

Recent research utilising ALA data by Jennifer Auld and others @EERC_UNSW found that a third of alpine species in Kosciusko NP have moved upslope (to ❄️ er conditions) - @4-10m per year.

Understanding 🌱 species responses to climate shifts is integral to judging their ability to adapt. If a plant cannot adapt in time, it will likely migrate to a familiar environment as its home gets warmer (higher altitude = colder 🥶).
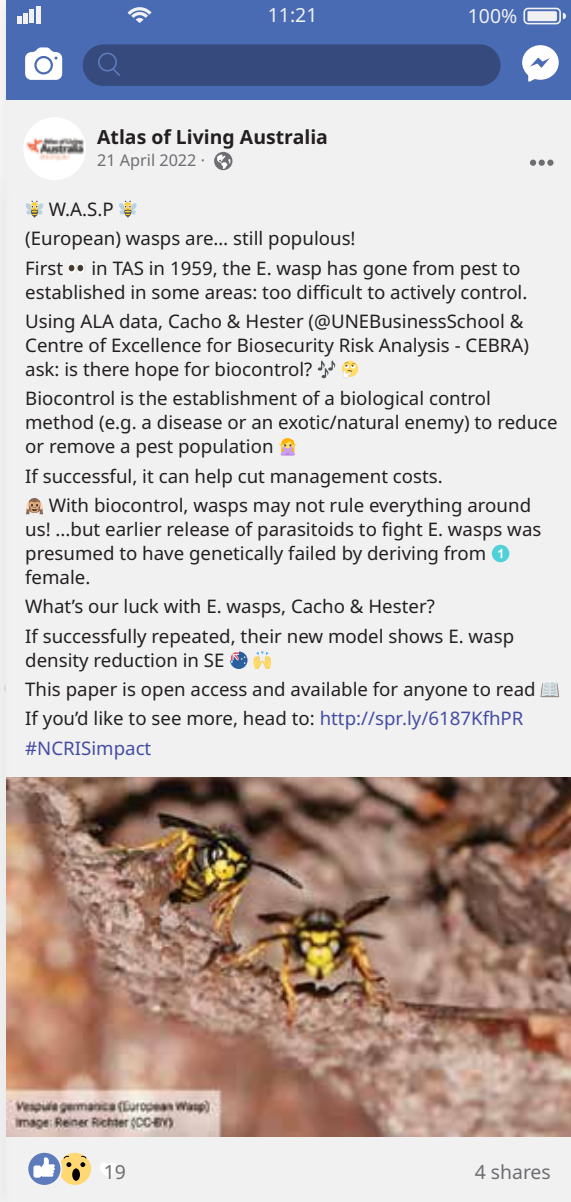
What does this mean for 🌏's alps?

Upslope 🏔️ migration is unfortunately a limited solution for Australian alpine species. We not only have substantially fewer alpine environments, but our mountain peaks are much lower than Europe or North America. 🌱 species therefore have less ground to colonise.

🌼 This paper is made freely available for anyone to read 📚, so if you would like to find out more about this study - head here! http://spr.ly/6187Kt3lz

Alpine Sunray (Leucochrysum alpinum) © Nina Kerr

👍😮❤️ 19   18 shares

Atlas of Living Australia
21 April 2022 · 🌐

🐝 W.A.S.P 🐝

(European) wasps are... still populous!

First •• in TAS in 1959, the E. wasp has gone from pest to established in some areas: too difficult to actively control.

Using ALA data, Cacho & Hester (@UNEBusinessSchool & Centre of Excellence for Biosecurity Risk Analysis - CEBRA) ask: is there hope for biocontrol? 🎶🤔

Biocontrol is the establishment of a biological control method (e.g. a disease or an exotic/natural enemy) to reduce or remove a pest population 🤷

If successful, it can help cut management costs.

🧙 With biocontrol, wasps may not rule everything around us! ...but earlier release of parasitoids to fight E. wasps was presumed to have genetically failed by deriving from 1️⃣ female.

What's our luck with E. wasps, Cacho & Hester?

If successfully repeated, their new model shows E. wasp density reduction in SE 🌏 🙌

This paper is open access and available for anyone to read 📖 If you'd like to see more, head to: http://spr.ly/6187KfhPR #NCRISimpact

Vespula germanica (European Wasp)
Image: Reiner Richter (CC-BY)

👍😮 19   4 shares

Atlas of Living Australia
4 November 2021 · 🌐

How can **@atlaslivingaust** support your research? 🤔

Recent work led by Anna Senior (@MonashUni) tested how habitat changes affect the distribution and evolution of the threatened Swamp Skink, Lissolepis coventryi 🌿

Want to know more? Access the study http://spr.ly/6185JX6AU or see our bite-sized thread #NCRISimpact

The Swamp Skink is dependent on freshwater swamps and densely-vegetated ecosystems, making it a tricky species to observe in the wild. Restricted to leftover (remnant) patches, this lizard is now classified as Endangered by the IUCN Red List of Threatened Species 🆘

With the help of distribution data 🗺️ 📍 from the ALA, the researchers identified groups of swamp skinks. Two genetically distinct populations were found – east and west of Melbourne, likely due to regional changes in geology and climate over time. This recent fragmentation is a concern for conservation of the species.

To promote genetic diversity and protect skink populations, the team suggest relocating selected skinks – by translocation 🚜 – and protecting habitat. They also recommend future surveys to improve species data. Every observation helps! 📸 🌿

Lissolepis coventryi (Swamp Skink)
Image: Owen Lishmund (CC 4.0)

👍😮❤️ You and 99 others   100 Comments

Atlas of Living Australia
20 January 2022 · 🌐

Oh, 🦌 –
Invasive deer damage ecosystems in SE NSW

To get ahead, Heather Burns & others at ANU Fenner School of Environment & Society modelled possible habitats of 5 🦌 species w/ data from field surveys, NSW Department of Planning, Industry and Environment & the ALA.

Findings indicate Coastal Saltmarsh may be at highest risk http://spr.ly/6188KDK24

🦌 have long been found to damage Australian ecosystems, but a lack of sufficient data on their distribution makes it difficult to decide on efficient management strategies. Identifying where deer populations might emerge or migrate is integral to their management ••📈

Often, genetic diversity 🧬 = population resilience (e.g. to protect from disease or recover after a natural disaster). Driving populations of 🦌 into genetically separate, identifiable groups could make managing them more effective, protecting our native ecosystems 🌱

Other recent research led by Christopher Davies at Federation University Australia has also worked on this problem, locating genetically distinct populations of Sambar 🦌 in Victoria (with the help of deer distribution data from the ALA 🦌) http://spr.ly/6180KDK2A

Fallow Deer (Dama dama)
Image: Marianne Broug (CC-BY-NC)

👍 7   2 shares

Supporting decision-making

By harmonising biodiversity data from many data partners across research, industry, state and local governments, and community groups, the ALA is well positioned to support national biodiversity and environment programs.

EcoCommons

As one of 10 pioneer data partners and supported by NCRIS, the ALA has collaborated with other Australian research institutions to create a single platform for environmental modelling and analysis - EcoCommons. In developing the EcoCommons platform, we are aiming to be the platform of choice to empower researchers, practitioners, and citizen scientists with access to trusted datasets and high-quality modelling tools. Ultimately, this means better, faster, and more accurate conservation outcomes for Australian biodiversity. Using EcoCommons' Data Explorer tool, users can leverage the ALA's 100 million species occurrence records to map and visualise biodiversity changes. EcoCommons offers a one-stop-shop approach to providing data, models and online workspaces to inform and enable best-practice decision making to accelerate environmental problem solving.

Launching November 2022, EcoCommons is a world-first collaborative free online platform.

> *Ecological models available at EcoCommons are powered by the accessible occurrence data from the Atlas of Living Australia. Plentiful ALA occurrence data and recent improvements in data filtering now allow the user to find better quality data which improves model results and subsequent decisions.*

– Dr Elisa Bayraktarov, EcoCommons Program Manager

Frilled-Neck Lizard *(Chlamydosaurus kingii)* via iNaturalist ⊙ Travis W Reeder

Giant Barred-Frog
(Mixophyes iteratus)
briancadam

Restricted Access Species Data (RASD) Project

Although the ALA is an open-access national biodiversity data infrastructure, some species have sensitivities around disclosing their exact location as this would risk disturbance, harm, or even poaching.

Currently sensitive species data are managed independently by different data holders; however this has historically created barriers for knowledge sharing and species management. As such, the RASD Project was developed as a national evidence-based approach to help protect Australia's most sensitive species. ALA has collaborated with governments around Australia, the Australian Research Data Commons, EcoCommons and the Western Australian Biodiversity Science Institute to develop the RASD Framework as the first nationally consistent approach to managing sensitive species in Australia. This allows a streamlined approach to sharing data with people who are working on restricted threatened species projects securely as well as improving the conservation outcomes for vulnerable species.

The aim is to build an effective data ecosystem where the best data are available to support research and conservation action. The lack of a reliable framework for describing and sharing sensitive species information has acted as a significant barrier to data flow. If completed successfully, RASD will provide much needed confidence to data contributors, managers and users to free up the flow of data in a secure environment.

– Ron Avery, STL Biodiversity Information Systems, NSW Dept Planning and Environment

Gouldian Finch *(Chloebia gouldiae)* via iNaturalist
Paul Whitington

Partnering with communities for impact

Big Bushfire BioBlitzes

In collaboration with ecologists from the University of New South Wales (and other institutions), we ran a series of 3 bioblitz events in summer and autumn 2022. The bioblitzes enabled scientists and community members to survey biodiversity (flora, fungi, fauna) over a set period of time in 3 different locations affected by the 2019-20 bushfires.

More than >7,900 records were collected and they are now publicly available in the ALA to help inform bushfire research.

This work was supported by the Australian Government's Bushfire Recovery for Wildlife and their Habitats program (managed by the Department of Climate Change, Energy, the Environment and Water (DCCEEW), formerly the Department of Agriculture, Water and the Environment (DAWE).

Participants at the Big Bushfire BioBlitz 2022, NSW

Launch of a new Indigenous knowledge tool

Working closely with the Noongar Boodjar Language Cultural Aboriginal Corporation, we launched the Noongar Boodjar plant and animal online encyclopaedia in November 2021.

The encyclopaedia brings together Indigenous knowledge and western scientific information about plants and animals in Noongar Nation in south-west Western Australia for the first time.

> *In the past there has been no formal mechanism to digitally capture the layers of Indigenous meaning around plants and animals beyond Western science. In addition to developing the online encyclopaedia, an important part of this project was establishing 'ways of working' protocols and strong inter-organisational relationships between the language centre and the ALA.*
>
> – Denise Smith-Ali, Senior Linguist at the Noongar Boodjar Language Centre

People highlights

Peggy Newman,
ALA Data Team Leader

Meet our data team

Biodiversity data is the ALA's bread and butter and the team responsible for liaising with our large network of data providers to collate, standardise and ingest biodiversity records is our Data and Support Team.

With a background in data warehousing, Peggy Newman ably leads the team and is well supported by Raj Chavan, Tim Hicks, Niels Klazenga, Patricia Koh, Rosemary O'Connor, Doug Palmer, and Mahmoud Sadeghi.

The team has an ever expanding knowledge of data management practices, big data infrastructure and biodiversity information standards such as Darwin Core. They use a wealth of skills and knowledge in data engineering and analytics, software development, taxonomy, geospatial, FAIR principles and linked data to work on the data centric components of our back end systems.

Raising ALA's awareness through training and outreach

Knowledge sharing is in the ALA's DNA. By empowering the community to best utilise ALA tools and functions through training and outreach, we further increase accessibility of biodiversity data.

This year, the ALA established Hacky Hour and ran workshops on how to use the ALA and the Galah R package as part of our training and outreach activities.

Donut Nembrotha
(*Nembrotha rosannulata*)
📷 Chris Ross

> **We're always up for a challenge. Working with data providers to get their data in tip top shape so it can be ingested into the ALA and made available across the world is very satisfying.**
>
> —Peggy Newman, ALA Data Team Leader

Ghost Fungus
(Omphalotus nidiformis)
📷 Monica Knipler

ALA events and user support

Throughout the year we hosted a number of events, engaging directly with more than 750 users and stakeholders.

Webinars

- September 2021 Saving species at speed – Conservation and the science of animal movement with Holly Kirk (RMIT), Julia Ryeland (University of Western Sydney) and Ross Crates (ANU)

- December 2021 Environmental data infrastructures – Data and technology trends with Ana Belgun (Data61), Arve Solland (EcoCommons), and Miles Nicholls (ALA)

- March 2022 New data from historic collections with Rocio Aguilar (Monash University), Emily Roycroft (ANU) and Olly Berry (CSIRO)

- May 2022 Protecting Australia's ecosystems: novel approaches to biosecurity management with Alexander Schmidt-Lebuhn (CSIRO), Andrew Turley (QLD Department of Agriculture and Fisheries), and Paul Tudman (BioSecurity Commons).

Hacky Hour and ALA support

- In 2022 we hosted our first Hacky Hour, a live drop in event where users can ask ALA staff questions about how to use the ALA. We are committed to hosting regular Hacky Hours, check our social channels and newsletter to find out more

- Over the last year, our support team resolved 638 helpdesk tickets at an average of 68 per month.

Conferences

Throughout 2021-22, the ALA attended the following conferences:

- Biodiversity Information Standards (TDWG) virtual Conference October 2021
- Australasian Plant Conservation Conference April 2022
- 2nd Australian Biosecurity Symposium May 2022
- Australian society of herpetologists (ASH) Conference July 2022
- Society for Open, Reliable, and Transparent Ecology and Evolutionary Biology (SORTEE) Conference July 2022
- UseR! Conference June 2022.

Governance

ALA Advisory Board

The ALA Advisory Board provides vision, advocacy and guidance to the ALA executive team to support the ongoing delivery of world-class biodiversity data infrastructure. The Advisory Board met three times including recommencing our in-person meetings in Hobart in April. Our Hobart board meeting gave the board an opportunity to connect with stakeholders from CSIRO, EcoTourism Australia, Tasmanian Environment Protection Authority, Integrated Marine Observing System, Tasmanian Land Conservancy, Tasmanian Museum and Art Gallery, and the Tasmania Fire Service. We were also pleased to appoint Dr Ian Cresswell, Adjunct Professor School of Biological, Earth and Environmental Sciences, UNSW as ALA's new Advisory Board Chair in September 2021. Ian brings a wealth of national experience in science, policy and program delivery to our work. For a full list of ALA Advisory Board members and executive, visit **https://www.ala.org.au/governance**

Dr Ian Cresswell,
ALA Advisory Board Chair

Acknowledgements

We thank each and every organisation, community and individual for your contributions and support. The ALA would not be possible without you. However, with more than 800 data partners it is a difficult task to acknowledge everyone, so please forgive any omissions.

Advisory Board (2021–22)

- Professor David Cantrill, Royal Botanic Gardens Victoria
- Dr Bek Christensen, Queensland University of Technology
- Chair: Dr Ian Cresswell, UNSW
- Dr Aaron Dodd, CEBRA
- Dr Stephen Van Leeuwen, Curtin University
- Mr Matthew Miles, South Australian Department for Environment and Water
- Ms Toni Moate, CSIRO
- Dr Andre Zerger, Atlas of Living Australia.

Partners

- Council of Heads of Australasian Herbaria (CHAH) – Australasian Virtual Herbarium
- Museums Victoria – Biodiversity Heritage Library
- Australian Museum – DigiVol
- Australian Biological Resources Study (ABRS) – Flora of Australia
- Global Biodiversity Information Facility
- iNaturalist
- Council of Heads of Australian Faunal Collections (CHAFC) – Online Zoological Collections of Australian Museums (OZCAM).

Collaboration partners

National Research Infrastructure Strategy (NCRIS) facilities

- Australian Research Data Commons (ARDC)
- Australian Urban Research Infrastructure Network (AURIN)
- Bioplatforms Australia
- Integrated Marine Observing System (IMOS)
- National Computing Infrastructure (NCI)
- Terrestrial Ecosystem Research Network (TERN)
- National Imaging Facility (NIF).

Australian collaborative projects

- EcoCommons
- Collaborative Species Distribution Modelling.

Department of Climate Change, Energy, the Environment and Water (DCCEEW)

- Monitoring, evaluation, reporting and improvement tool (MERIT)
- Murray–Darling Basin Authority hub
- Biosecurity Monitoring Through ALA Network
- National Environmental Science Program
- Citizen Science Bushfire Recovery Project Finder
- Collaborative Species Distribution Modelling
- EcoAssets for State of the Environment reporting.

International collaboration partners

- International Living Atlases
- iDigBio.

Western Australian Government

- Index of Biodiversity Surveys for Assessments (IBSA)
- Index of Marine Surveys for Assessments (IMSA).

Centre for Invasive Species Solutions

- Weeds Australia.

Indigenous ecological knowledge groups

- Kamilaroi, Ngukurr, Noongar-Wudjari, Olkola and Warriyangga people, communities and Country.

Universities and research organisations

- Australian National University
- Charles Darwin University
- Commonwealth Scientific and Industrial Research Organisation (CSIRO)
- Macquarie University
- Monash University
- University of Adelaide
- University of Canberra
- University of Melbourne
- University of New South Wales
- University of Western Australia
- University of Queensland
- University of Sydney
- Western Australian Biodiversity Science Institute (WABSI)
- Plant Health Australia
- Australian Institute of Marine Science (AIMS).

Peak bodies
- Australian Citizen Science Association
- Environmental Consultants Association Western Australia
- National Academy of Sciences
- Taxonomy Australia.

Data partners

Authoritative and reference data
- Australian Biological Resources Study (ABRS)
- Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES)
- Geoscience Australia
- Australian Faunal Directory (AFD)
- Australian Plant Names Index (APNI)
- Australian Plant Census
- AusFungi
- AusMoss.

Natural science collections, museums, herbaria, galleries and libraries
- All state and territory natural history collections
- Council of Australasian Museum Directors (CAMD)
- Council of Heads of Australian Faunal Collections (CHAFC)
- Council of Heads of Australasian Herbaria (CHAH)
- National Research Collections Australia (CSIRO)
- National Library of Australia (Trove)
- University herbaria and natural science collections.

International science agencies
- New Zealand Organisms Register.

Australian Government
- Department of Agriculture, Water and the Environment
- Department of Education, Skills and Employment
- Department of Industry, Science and Resources.

State, Territory and Local Governments
- ACT Government
- Brisbane City Council
- New South Wales Government Department of Planning, Industry and Environment
- Northern Territory Government Department of Environment and Natural Resources; Central Land Council
- Queensland Government Department of Environment and Science

- South Australia Department for Environment and Water
- Tasmanian Government Department of Primary Industries, Parks, Water and Environment
- Victorian Government Department of Environment, Land, Water and Planning; Office of the Lead Scientist
- Western Australian Government Department of Environment and Energy; Environmental Protection Agency.

Non-government organisations, community groups and conservation groups
- BirdLife Australia
- ClimateWatch
- Earthwatch
- eBird
- Greening Australia
- Landcare
- MangroveWatch.

Citizen science apps and projects
- Birdata
- Butterflies Australia
- eBird
- Echidna CSI
- FrogID
- iNaturalist Australia
- NatureMapr
- QuestaGame
- and many more.

Image credits

p1   Azure Kingfisher *(Ceyx azureus)* ☻ David White

p2   Southern Brown Bandicoot *(Isoodon obesulus)*
☻ Michael Keogh

p2   Spectacled Flying Fox *(Pteropus conspicillatus)*
☻ kcomeau

p5   Butterfly collections ☻ ANIC Butterflies

p7   Australian Magpie *(Gymnorhina tibicen)*
☻ Matt Campbell

p8   Crested Katydid *(Alectoria superba)*
via iNaturalist ☻ Third Silence Photography

p9   Fly Agaric Fungus *(Amanita muscaria)* ☻ R. Reiner

p9   Leafy Seadragon *(Phycodurus eques)* ☻ Martin

p11   Screaming Tree Frog *(Litoria quiritatus)*
☻ Darkes Forest Rowley2

p11   Dunnart *(genus Sminthopsis)*
☻ SA Department for Environment and Water

p12   Lord Howe Moray Eel *(Gymnothorax annasona)*
via iNaturalist ☻ Steve Smith

p13   Purple Tassels *(Sowerbaea laxiflora)*
via iNaturalist ☻ Possumpete

p16   Frilled-Neck Lizard *(Chlamydosaurus kingii)*
via iNaturalist ☻ Travis W Reeder

p17   Giant Barred-Frog *(Mixophyes iteratus)*
☻ briancadam

p17   Gouldian Finch *(Chloebia gouldiae)*
via iNaturalist ☻ Paul Whitington

p19   Witchetty Grub *(Endoxyla)*
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p20   Donut Nembrotha *(Nembrotha rosannulata)*
☻ Chris Ross

p20   Ghost Fungus *(Omphalotus nidiformis)*
☻ Monica Knipler

p23   Black-Footed Rock Wallaby *(Petrogale lateralis)*
☻ Third Silence Photography

p24   Anemone Stinkhorn Fungus *(Aseroe rubra)*
☻ Noah Siegel

Citing this publication

Contact us
support@ala.org.au

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