Atlas of Living Australia
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Atlas of Living Australia Annual Work Plan

2020-2021

NCRIS National Research Infrastructure for Australia
An Australian Government Initiative

CSIRO

The ALA is made possible by contributions from its partners, is supported by NCRIS and hosted by CSIRO.

Executive summary

The ALA annual workplan details the projects, activities and major investments planned in a financial year to deliver on the strategic priorities articulated in the ALA Strategy 2020-2025. The workplan is endorsed by the ALA Advisory Board and aligns with the Annual NCRIS Business Planning process. It is released publicly to provide our stakeholders greater visibility on ALA priorities, and to provide opportunities for collaboration. Year 1 of the workplan represents a foundation year with a primary focus on the upgrade of our systems and infrastructure (Robust services), improving how the ALA deals with the data quality challenge (Trusted data) and improving our ability to generate metrics to report on impact.

Introduction

The Atlas of Living Australia (ALA) is a National Collaborative Research Infrastructure Strategy (NCRIS) project responsible for mobilising biodiversity data to support national and international users demanding timely access to Australian biodiversity data. The ALA provides biodiversity data to over 82,000 users in research, industry and government annually. It delivers impact and supports research excellence in fields such as biodiversity, genetics and ecosystem science, delivers to major natural resource management programs and supports the international research community through the provision of Australian data to the Global Biodiversity Information Facility (GBIF). The ALA is founded on the principle of open data access realised through a Creative Commons (CC) licence model. This is important in the context of maximising re-use of data produced, collected, held and funded by government as well as contributing data. The ALA currently holds over 90 million records of more than 111,000 species from across Australia and elsewhere.

ALA Strategy 2020-2025

After almost a decade of operation, combined with a shift in stakeholder expectations of what constitutes a fit-for-purpose national biodiversity infrastructure, the ALA has recognised the need to develop a new strategy. The ALA Strategy 2020-2025 was released in July of 2020 and is framed around four strategic priorities, which are (a) trusted data, (b) robust services, (c) partnering for impact, and (d) support decision-making. The development of the strategy was informed by a comprehensive ALA Future Directions National Consultation process completed late in 2019. Key outcomes from the consultation included recognition that users will need to access, upload and integrate different data types from the typical biodiversity occurrence record; this can include genetic data, eDNA, sensor network data including imagery and acoustics. Access to trusted biodiversity data accompanied by metadata will continue to be a fundamental requirement to support research and decision-making. Third, access to longitudinal or time-series biodiversity monitoring data and ecological plot data will be essential to understand changes, trajectories and to predict future states of biodiversity. And finally, stakeholders identified a need that, for the ALA to deliver greater national benefit to research and decision-making, data holdings will need to be more geographically and taxonomically representative and comprehensive to address the major national biodiversity management challenges.

The results of the ALA Future Directions National Consultation provide the reference data that has shaped the strategy. However, it has also been developed in response to internal priorities often opaque to our external stakeholders, foremost of which is the need to upgrade ALA infrastructure to address extant infrastructure challenges and anticipated needs around new data streams. In addition to guiding the ALA's future state, the strategy will also provide stakeholders greater clarity regarding the ALA's priorities thus highlighting opportunities for partnering and aligning. These annual priorities will be communicated to stakeholders through the annual ALA work plan.

About the ALA Annual Work Plan – 2020-21

The annual work plan describes the new projects, activities and major investments planned for each financial year to deliver on the priorities articulated in the strategy. It provides an indication of resources committed (Table 1) and where appropriate identifies the ALA lead that can act as a point of reference for external stakeholders. The primary objective of the workplan is to provide our Advisory Board, the NCRIS program and our partners greater insight into activities of the ALA, potentially leading to partnership opportunities. The work plan will be reviewed by the ALA Advisory Board at its March meeting in preparation for public release and/or consultation prior to the commencement of each financial year in July. Owing to the recent release of the ALA Strategy in July 2020 this year 1 work plan represents a transition year so public release has been delayed until November 2021. Figure 1 shows the relationship between the workplan, ALA strategy and key timelines leading to public release prior to the beginning of each financial year in June.

Table 1. Indicative size of activities in ALA workplan

Full time equivalent staff need to scope, undertake and deliver activity	Size
< 1FTE	Small
1-2 FTE	Medium
>2 FTE	Large

Figure 1.0. Relationship between the ALA strategy, NCRIS business planning and the ALA's annual work plan.

Operations (Business as Usual) Framework

This workplan focuses on the new activities planned for 2020-21. In parallel the ALA continues to provide extensive operational support for our systems and users framed around its four key functions of data, applications, systems and projects. These functions are described further in Table 2.

Table 2. Overview of ALA operational functions

Data	The data management team works with data providers and supports the systems for ingestion. The team is working towards the following major goals: (a) streamlining data ingestion - sharing the workload of standardisation and automation with data providers wherever possible, (b) rewarding data providers for sharing data with the ALA by helping them manage their data loads, assess data quality and track how their data is being used, (c) broadening the types of data that can be ingested by working with data providers, users and local and international informatics community's data
Applications	The Applications Team manages and maintains several client-facing applications to ensure that they continue to be fit-for-purpose and deliver capabilities which are consistent with ALA's strategic objectives and maximise fulfilment of the requirements and expectations of the largest possible communities of users. Applications include BioCollect, MERIT, DigiVol, Profiles platform, ALA4R, iNaturalist Australian Node, ZoaTrack and Phylolink. These applications support the access, analysis and collection of data for ingest into the ALA. They are one of the key areas of initial engagement of new users with all ALA services and often the capabilities around which many vital external partnerships are built.
Systems	The systems team maintains and enhances ALA software for back-end systems, with a focus on code quality, security, improved automated testing, deployment and improved customer experience. The team ensures that core ALA backend systems are secure and robust by monitoring server vitals, system logs, usage and security. A major function includes administering server infrastructure in hosted environments (AWS, NCI, Nectar, IM&T) to ensure operating systems are up to date, security patches are applied, file systems and databases are regularly backed up (robust services & trusted data), intrusion detection is appropriately configured, etc. (robust services).
Projects	The ALA projects team provides expert project management, analytical skills and sector knowledge to support the delivery of ALA's strategic and operational priorities. This includes design, maintenance and delivery of the ALA Project Management Framework, including business processes and methodologies, documentation templates, and approval mechanisms through the Projects Oversight Board and Resourcing Forum. The team are also responsible for managing the ALA Change Advisory Board which governs the processes, documentation and approvals for software code changes and deployment across ALA systems. Finally, it provides project management and business analysis capability to ALA projects.

2020-21 at-a-glance

The 2020-21 work plan details the first year of delivery of ALA's Strategy 2020-2025 and, as such, represents a transition year in response to the recommendations from the 2019 ALA Future Directions National Consultation Process.

Priority activities include the core infrastructure upgrade project under our Robust Services pillar to deliver improved system capability that will future-proof ALA systems and achieve a greater degree of alignment with GBIF architecture. In the longer term this will provide resource efficiencies across both our teams. The initiation of the data quality project is a targeted response to addressing our stakeholder's expectation regarding how the ALA provides trusted data to its users. This will be delivered in consultation with a project reference group to help establish priorities and offer feedback on proposed solutions. As an eResearch infrastructure the ALA collects many system and user metrics however to-date these have not been integrated into a common reporting framework. The metrics and impact reporting activity will revolutionise how the ALA captures and reports on these metrics allowing the ALA to report on impact and also support our data partners with improved use metrics.

Partnerships remain a critical element of ALA's operating model and in Year 1 the ALA will be looking to formalise existing informal agreements and establish new partnerships, particularly with our partner NCRIS facilities including TERN and IMOS to deliver greater collective benefit to research and decision-making.

Strategic Priority 1: Deliver trusted data

Trusted high-quality data are fundamental to supporting world-leading biodiversity research and delivering value to decision-making. The ongoing challenge of working with our community to improve and better communicate the quality of biodiversity data in the ALA emerged as a dominant theme from ALA's 2019-20 national consultation process. Data quality is a general term referring to taxonomic and spatial accuracy of data, but also the temporal and geographic coverage of biodiversity data in the context of its ability to support research and decision-making.

Title	Description	Lead	Size	Strategic action
Data Quality Project Feb – Dec 2020	The Data Quality Project is developing products that improve access to data, and ability to assess fitness-for–use. This includes software development and other activities (e.g. training, workshops or other engagements) to enhance understanding of the quality characteristics of data available via the ALA.	Miles Nicholls	Large	1.1 1.2
Metrics & impact reporting project Feb – Dec 2020	The Metrics/Impact Reporting Project aims to develop a reporting framework to capture ALA's impact and outputs. This includes making improvements on how we access metrics from disparate data sources across the ALA, in order to make them easier to incorporate into reporting and enable stakeholders to access information on their data resources via a self-service portal. A more streamlined approach to collecting and displaying our metrics will increase consistency in recurrent and ad-hoc reporting, enable us to better monitor trends and respond better to changes in user behaviour. We also anticipate the development of an Annual ALA Impact Report as part of this project. We will be working closely with relevant stakeholders throughout the project to ensure their data needs are taken into consideration during the solution development.	Corinna Paeper	Medium	1.1 4.1
Industry environmental assessment data pilot activity	Industry Environment Assessment Data (IEAD) – As part of a strategic collaboration with the Department of Water and Environmental Regulation (DWER, WA), DWER has agreed to work with ALA to promote IBSA data into	Peter Brenton	Small	1.5 1.6

Jan 2021 – Jun 2021	machine readable format for public access. This marks the start of ALA accessing IEAD, which was not previously shared. As the first step, DWER will provide a report on the licensing status of the current IBSA database with which ALA can then plan how to mobilise the data. DWER is also exploring a technical solution to upload metadata in a machine-readable format, which will also require support and development effort by ALA. ALA also provides hub services for WA DWER to store EIAD data.			
Data management automation and standardisation Jul 2020 – Jun 2021	The ALA's core infrastructure upgrade project brings an opportunity to refine the data ingestion pipeline from our data providers into our internal systems. We seek to improve the velocity of data uploads and refreshes by encouraging data providers towards using standard formats and self-service tools where possible. Internally we look to providing the right technology mix to be able to automate processes and reduce hands on intervention in data preparation while maintaining quality assurance workflows. These changes will require outreach in the form of seminars, workshops and changes to our knowledge base articles on data submission.	Peggy Newman	Medium	1.3 1.5

Strategic Priority 2: Provide robust services

Thousands of users across research, government, industry and community sectors utilise ALA data and services to contribute, mobilise, access and analyse data. Beyond only data provision to the central ALA database, ALA infrastructure also supports our stakeholders to mobilise and manage their data through BioCollect, DigiVol and Atlas hubs as just some examples. The evolution of the ALA from its beginnings to being one of the world's foremost biodiversity infrastructures supporting a growth of 10 million biodiversity occurrence records annually also requires a rethink, and potentially system re-design to deliver robust data services into the future. This includes both the 'soft' enablers such as how we interact with and respond to user requests, to system upgrades to support the increasing data volume, variety and velocity of data expected from new biodiversity data streams. New data streams challenging the ALA will include plot-data, genetic information, acoustic, sound and video and increasingly higher quality images. This strategy makes a commitment to improving the user experience and uplifting the robustness of our infrastructure to ensure it remains at the forefront of biodiversity data delivery.

Title	Description	Lead	Size	Strategic action
Core infrastructure upgrade project Dec 2019 – Jun 2021	The Core Infrastructure Upgrade Project is replacing the various components of the ALA occurrence record system with software developed by Global Biodiversity Information Facility (GBIF) with adaptations for the ALA's specific requirements. After 11 years of active development, the ALA's core data processing infrastructure is approaching 'end of life'. The Infrastructure Upgrade Project will enable the ALA to adapt to changing data and user requirements heading into our next decade of operation. We are working closely with GBIF throughout the project and sharing updates with our user and stakeholder communities and the international Living Atlases community.	Javier Molina	Large	2.1 2.4 2.5 2.6 3.1 4.4
API Gateway Development project Mar 2021 – Jun 2021	ALA's public-facing APIs are currently fully open for public consumption but the granularity these are accessible at varies. This makes it difficult to be able to contact consumers when services change and makes it near impossible for the ALA to gauge our impact through these services. This project aims to develop a common API gateway facility for all ALA API services, including the existing public-facing services as well as new services planned for development and currently under construction for the Profiles and Ecodata applications. This gateway facility will enable external clients/users of the API to	Peter Brenton	Small	2.4 2.5 2.6

	access the services, thereby enabling usage logging for improved management and client communications as well as tracking of metrics for impact reporting.			
DigiVol product enhancements Sep2020 – Jun 2021	Enhancements made to DigiVol have enabled a significant increase in system usage and digitisation output. Institutions providing content to the system have increased supply to meet the increased demand which has maintained pressure on the infrastructure to support the increased load. The Australian Museum have employed a contract developer (50% ALA funded) to assist the ALA and AM in further enhancements over the next two years.	Peter Brenton	Small	2.1 2.2 2.4 2.5 2.6
Security review Jul 2020 – Jun 2021	ALA recognises the need to ensure appropriate security and privacy mechanisms are in operation to ensure data integrity and system availability and resilience. This project will implement agreed recommendations from an independent audit of ALA.	Hamish Holewa	Medium	2.1 4.4
Hybrid cloud hosting strategy	ALA's web sites, applications and services comprise over 50 separate systems that are hosted on over 150 server instances. A combination of commercial and research cloud infrastructures are currently utilised, based on each component's individual capacity, performance and reliability requirements. Software components have been designed to be run on both commercial and research hosting environments, which allows flexibility in assigning and moving components between different cloud hosting environments. This project aims to reduce costs by better utilising research cloud hosting, where possible. It also aims to review hosting technologies to allow more efficient hosting utilisation as well as provide better capacity management. December 2020 – June 2021	Nick dos Remedios	Small	2.1

Strategic Priority 3: Partner for impact

The ALA plays a national and international leadership role in the area of biodiversity informatics and IT system development to support the biodiversity sector. Its success has also leveraged the expertise and networks provided by our partners in museums, collections, government biodiversity data programs, partner NCRIS facilities and increasingly through our relationships with the citizen science sectors.

This strategy makes a commitment to further provide a national and international leadership role in the area of biodiversity informatics and to partner with those communities that provide complimentary skills through domains such as taxonomy, ecological modelling and national e-research partners. Globally our key partnership will continue to remain with the Global Biodiversity Information Facility where we will partner to achieve efficiencies and deliver improved data services. We also will partner with other international initiatives (e.g. iNaturalist) to ensure the Australian biodiversity community has access to the best research infrastructure, technology and methods.

Finally, this strategy will also guide the ALA in partnering with new sectors. These include industry and the environmental consulting sector which in many parts of Australia are the dominant sector acquiring new biodiversity data. Engaging more deeply with the biosecurity sector will also provide an opportunity to improve ALA record holdings while supporting national biosecurity surveillance and risk assessment needs.

Title	Description	Lead	Size	Strategic action
Indigenous Ecological Knowledge Project Jul 2020 – Jun 2021	This project seeks to recognise and make accessible IEK language terms for species, highlighting the biodiversity knowledge residing within indigenous communities and providing some context and point of access for both indigenous and non-indigenous researchers. This will provide researchers and members of the public with visibility of IEK knowledge and with the words with which to engage with IEK custodians regarding the species which exist within the communities. This will provide a tool to bridge the cultural gap between Western knowledge and IEK. In the process, ALA seeks to reinforce and sustain relationships with IEK already in place and create new ones in this the international year of Indigenous Languages	Ely Wallis (Nat Raisbeck-Brown)	Small	3.4
ALA sector engagement planning Jul 2020 - Jun 2021	Given the range and complexity of ALA's stakeholder relationships nationally and internationally we have embarked upon a process of formal sector engagement planning. This includes the development of a sector engagement plan framework to inform the	Andre Zerger	Medium	3.5 3.2

	development of plans and biennial reviews of progress and impact. The first of these plans is the Museums, Collections and Herbaria sector plan that has been socialised with key stakeholders in the sector and is now in delivery. The second will be considered by the Advisory Board at Meeting #10 and will focus on the Ecology, Evolutionary and Environmental Sciences. The third is likely to focus on the biosecurity sector given the emerging importance of this in ALA's Strategy 2020-21			
Higher education engagement planning Oct 2020 – Jan 2020	This project will conduct a review and identify options that ALA could pursue with regard to better supporting tertiary and postgraduate education sectors. The findings would shape the scope of an ALA higher education outreach function. The review will examine current approaches for delivering this function in other NCRIS facilities, identify gaps in requirements and existing programs and provide recommendations regarding what ALA could pursue to better deliver to and engage with this sector.	Jennifer Parsons	Small	3.2 4.5
Biodiversity Heritage Library Australia Jul 2020 – Jun 2021	The Biodiversity Heritage Library is an international aggregator for digitised literature. The BHL project in Australia is managed and run as a collaboration between ALA and Museums Victoria. The project aims to digitise Australian published biodiversity literature, upload to BHL and link to ALA. Access to literature is vital to the work of taxonomists and any other researcher interested in species and how they're described. The project is ongoing and supported by a team of staff and volunteers at Museums Victoria.	Ely Wallis (Nicole Kearney, Museums Victoria)	Small	3.3
External services and contracts review Jun 2020 – Jun 2021	External Services and Contracts Review – ALA is currently undertaking a series of review on its of external services in applications, hubs and hosting. The goal is to ensure formal partnership is revived and established with strategic stakeholders, and clear requirements identified to mitigate delivery risks.	Lu Jin	Small	2.3

Strategic Priority 4: Support decision making

In addition to mobilising, harmonising and delivering biodiversity data, the ALA provides users sophisticated decision-support tools through its website, tools such as the Spatial Portal, ALA4R and partnerships to deliver advanced analytics for example through virtual laboratories such as the Biodiversity and Climate Change Virtual Laboratory and EcoCloud. An outcome from such capability is a user-community with access to not only data, but also to the decision-making tools to support their business needs.

The ALA will continue to develop the decision-support tools to enable our users to derive the best value from Australia's biodiversity data. In parallel we will establish closer relationships with users to better understand their decision-making needs and expectations of biodiversity data, as well as to include longitudinal data, survey plot data and data that are 'analysis-ready.

Within five year's ALA data and services will be on a critical path for a number of national and state biodiversity monitoring, assessment and reporting programs and delivering data services to support decision-making. Use cases could include state biodiversity assessments and monitoring programs, and Commonwealth State of the Environment Reporting.

Utilising ALA's position of strength as an integrator across government and research sectors will ensure that Australia's best biodiversity data supports key decision-making needs.

Title	Description	Lead	Size	Strategic action
Cross NCRIS State of the Environment Reporting Project Jul 2020 – Jun 2021	Australia's National State of the Environment (SoE) Report is produced every five years by the Department of Agriculture, Water and Environment (DAWE) to meet the commonwealth's statutory reporting obligations. Spanning multiple chapters including biodiversity, climate change, inland water to name only a few, the chapter authors and the report rely extensively on high quality national environmental data. Given the increasing richness of data available now through NCRIS facilities since the last report was published in 2016, SoE provides the perfect use-case to develop new cross-facility data assets to support national environmental reporting. Integrated data products to support would have significant value beyond only the SoE program including for the research sector and to support related government programs. This partnership will develop SoE-focussed report-ready data assets by integrate biodiversity data from across TERN, IMOS and ALA. The opportunities include both enrichment of the main biodiversity data assets accessible through the ALA, and also	Andre Zerger	Large	3.2 4.2

	development of new datasets that enable researchers to work with community-level biodiversity data.			
Biosecurity Surveillance and Alert Pilot Project Oct 2020 – Dec 2020t	The ALA Biosecurity project aims to establish a strategic partnership with the Office of the Chief Environmental Biosecurity Officer (CEBO) at Department of Agriculture, Water and the Environment (DAWE). The initial pilot activity will create a joint work process to utilise the ALA's species discovery / occurrence network (such as iNaturalist and other data feeds), to generate an alert for new records of exotic species that are of interest to the CEBO and DAWE.	Michael Hope	Small	4.5
EcoCommons Australia Program Jul 2020 – Jun 2021	EcoCommons is a $6m ARDC collaborative program developed by a consortium of university, government and NCRIS partners. The program serves over 6000 unique users and acts as an important gateway for researchers and decision makers to utilise ALA data and integrate with other environmental data from other research and government facilities. The EcoCommons Program provides analytical models and workflows that increase value of ALA data. These include: Development an of advanced informatics workflows that allow research and decision makers to better understand biodiversity and the environment – including key indicators such as abundance, absence and population dynamic models; Provision of commonly used analytics software in the cloud including R and Python.	Hamish Holewa	Large	3.2 4.1 4.2
Biodiversity data application support to government programs and NGOs Ongoing	The ALA provides contracted software hosting and support services to DAWE for the MERIT application which is the principal tool for compliance and implementation recording and reporting on federal government investments in environmental protection and rehabilitation interventions. This tool provides important data to government which inform policies and programs to improve biodiversity and other environmental outcomes. ALA tools and services are also increasingly being used across the	Peter Brenton	Large	4.2 4.4 4.5

	natural resource management (NRM) sector, including by major environmental NGOs			
ALA4R upgrade Aug 2020 – Dec 2020	Use of the ALA4R package has been steadily increasing in the academic and research sectors. The current package of ALA4R scripts was developed several years ago and requires upgrading to ensure that it continues delivering effectively to the requirements of these important sectors. There is also untapped potential for wider use of the R suite across the ALA portfolio for enhanced ALA products and services as well as improved impact reporting.	Matilda Stevenson	Small	4.1 4.2 4.5