![Australian Government — Department of the Environment and Energy]

Submission Coversheet: Comments on Australia's Strategy for Nature 2018-2030

Overview

This submission coversheet should be used when you provide comments on the draft Revision of Australia's Biodiversity Conservation Strategy – "Australia's Strategy for Nature 2018-2030".

Contact Details

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Date:	16 March 2018

Do you want this submission to be treated as confidential? ☐ Yes ☒ No

Does this submission contain personal information about any person who is not an author of the submission? ☐ Yes ☒ No

If so, have they provided their consent?	☐ Yes	☐ No

Submission Instructions

Submissions should be made by close of business on **Friday, 16 March 2018**. The Department reserves the right not to consider late submissions. Where possible, submissions should be lodged electronically, preferably in Microsoft Word or other text based formats, via the email address:

NBSSecretariat@environment.gov.au

Submissions may alternatively be sent to the postal address below to arrive by the due date.

National Biodiversity Strategy Secretariat
Department of the Environment and Energy
GPO Box 787
CANBERRA ACT 2601

CITIZEN SCIENCE &
AUSTRALIA'S STRATEGY FOR NATURE 2018-2030

BACKGROUND

What is citizen science & what are its benefits?

Citizen science involves public participation and collaboration in scientific research with the aim to increase scientific knowledge (Australian Citizen Science Association definition, 2017). Citizen science can involve but is not limited to:

- identifying research questions,
- designing/conducting investigations,
- collecting and analysing data,
- developing data applications, communications and other technologies for science, and
- solving complex problems.

By involving members of the public in authentic scientific research, citizen science helps test new concepts, accelerates discovery, and involves the public in evidence-based decision-making to create an informed and active society (see also Chief Scientist 2015 Citizen Science Occasional Paper). Citizen science can also provide hands-on STEM learning outside of the classroom and can increase scientific literacy and awareness. It has been demonstrated to have the capacity to augment and enhance traditional scientific research and monitoring approaches by: increasing spatial and temporal frequency, increasing geographic extent or temporal scale, reducing time and labour costs. Citizen science harnesses the power of communities across a wide range of disciplines from microbiology, biodiversity, medicine, public health, through to astronomy.

Citizen science as a growing and connected community in Australia and internationally

The Australian Citizen Science Association (ACSA) was formed in May of 2014 to advance citizen science through the sharing of knowledge, collaboration, capacity building, and advocacy. ACSA is a member-based community that supports, informs, and develops citizen science. In 2016 ACSA finalised its strategic plan (Annex A). Currently the association has over 250 paid members, 3 new state-based chapters (WA, SA, Vic), a number of working groups including a Data & Metadata Working Group, as well as a large social media following (over 4,000 across Twitter and Facebook) and a newsletter with over 1,100 subscribers. ACSA works closely with its three sister associations: the United States Citizen Science Association, the European Citizen Science Association, and the emerging CitSciAsia. Most recently ACSA has been collaborating on a global scale to help advance citizen science for a sustainable world and is working with the United Nations to advise on how citizen science can be used to address the UN's Sustainable Development Goals, taking part in the global initiative to have 1 billion global citizens engaged in citizen science by 2020.

In February 2018 the 2nd Australian Citizen Science Association conference was held in Adelaide (an overview can be found here). The conference brought together citizen science practitioners, participants, thought leaders, and decision-makers. The conference also featured international keynote speakers along with Australia's Chief Scientist Dr Alan Finkel, South Australia's Chief Scientist Dr Leanna Read, and the 2017 Eureka citizen science prize winner Dr Emilie Ens from Macquarie University and the Indigenous Ngukurr Wi Stadi bla Kantri (We Study the Country) Research Team. The aim of the conference was to showcase best practice in citizen science and share project outcomes from across Australia and globally. Over 250 delegates attended from across Australia, New Zealand, Asia, Africa, Europe and the United States. A significant proportion of speakers and presentations were those involved in nature and/or biodiversity related citizen science – from threatened species, frogs and fungi, coral reefs, water ecology, pesticide pollution, to urban biodiversity – as well as those technologies, innovations and infrastructures supporting this sector of citizen science, such as artificial intelligence, crowdsourcing, gamification, information management platforms and apps, digitisation, remote sensing, and modelling. The conference also highlighted best practice approaches such as engagement and partnership methods with citizens, communities and stakeholders; communication tools and practices; roles in education, social capital & justice, policy and decision making; as well as participatory and co-design of projects; and monitoring and evaluation of outcomes and impact.

Globally citizen science is gaining momentum, with estimates that citizen science projects from around the world involve between 1.3 to 2.3 million people in the biodiversity space alone, and that they make in-kind contributions worth up to US $2.5 billion annually (Theobald et al 2014). No current estimates exist for the value of the citizen science contribution for Australia. The Atlas of Living Australia (a NCRIS research infrastructure) in partnership with ACSA have developed an Australian citizen science project finder. The project finder currently has over 360 citizen science projects that people can discover participate in and contribute data to, with over 90% of those projects being nature related. In 2017 an Australian federal citizen science grant round for a total of $6.3 million over 4 years was announced. The grant round attracted over 380 applications with a total funding request of over $300 million. With only a 3% success rate the grant round demonstrated the interest in citizen science nationally and the need for increased citizen science funding opportunities. A seminar held in Canberra in February 2018 with representatives from government, academia, and industry highlighted the huge interest nationally and the need for building

communities of best practice, including in the research and government agency sectors. Government's important role was also recognised not only through making available specific funding but also its support for underlying infrastructures to help improve citizen science data mobilisation and standards as well as leveraging citizen science to complement and augment the government's investment in policy, science, and education.

Citizen science as part of Australian policy delivery

Citizen science provides an opportunity for a new approach in Australian science-society-policy interactions and implementation. It has been recognised in reports such as the Australia State of the Environment 2016 that "*concerted citizen science efforts are contributing to our understanding of biodiversity and to management of biodiversity in Australia*". But the citizen science community recognises that to effect change and impact across the science-society-policy interaction space in a nature context, there is a need for integrated approaches that are not just sector/stakeholder-by-sector/stakeholder directed. The White Paper on Citizen Science for Europe provides an example of a framework for citizen science that can be applied in a nature policy context looking at the responses and solutions at the macro/strategy (policy framework), meso/plans (citizen science mediators) and micro/action (individuals, communities) levels.

Recognising the national and international policy actions/agendas/strategies for nature in the draft Strategy (Figure 1), one can also come at the issue from an innovative perspective and consider the role innovation plays as a driver and solution for a strategy for nature. Relevant innovation policy agendas where nature-based citizen science can play a role if specifically or systematically recognised, included and/or mobilised include:

- *National Innovation & Science Agenda:* e.g. support for environmental e-infrastructures and standards for discovering and aggregating data, including citizen science generated data; digital businesses and entrepreneurs supporting citizen science (see examples of businesses in Annex B);
- *Open Government:* e.g. harnessing the power of the citizen science "crowd" to engage with government data, or building dynamic and inclusive communities by creating through citizen science new interaction channels between policy makers, scientists, and citizens;
- *Closing the Gap:* e.g. Indigenous businesses leveraging their natural and cultural assets in an emerging citizen science tourism market.
- *Australia 2030 – Prosperity through Innovation* report – the key pillars of this report align strongly with the strategic objectives and outcomes of citizen science: for instance *Education*: citizen science as a stepping stone to and for STEM education, and science literacy; *Culture & Ambition*: imagine if you had 100,000 people to help with national mission research such as those mentioned in the report: genomics (e.g. US crowd citizen science projects such as Foldit (protein folding), Eyewire (mapping the brain), PatientsLikeMe (patients sharing experiences and data) through to Great Barrier Reef management and marine research (see as an example the work of the Reef Citizen Science Alliance in Annex B).

The NSW Department of Environment & Heritage is an example of a state government that has expressly committed to citizen science through its OEH Citizen Science Strategy and position statement, focusing OEH effort on filling priority information gaps through the support and growth of citizen science projects and making data and information provided by the community open, accessible and giving citizen scientists an improved understanding of how that information is used.

CITIZEN SCIENCE IN AUSTRALIA'S STRATEGY FOR NATURE

ACSA supports the need for a clear, coordinated, and long term strategy for nature in order to achieve the vision outlined in Australia's Strategy for Nature 2018-2030, but most importantly the clarity and commitment to the policies, programs, tools, and resources to actually effect action, change, and impact. ACSA believes that citizen science can play a foundational and connecting role in the shared roadmap to connect people with nature, care for nature, and build and share knowledge.

Key suggestions or comments regarding the draft Strategy include:

1. Citizen science contributes to all draft Strategy goals and objectives

Citizen science is and continues to make valuable and increasing contributions to meeting the 12 objectives of Australia's Strategy for Nature 2018-2030, beyond the objective (Objective 2) where it is specifically mentioned. The diversity of its actors, actions, and approaches lends itself to being a key partner for change from a local to international level. Annex B provides just a few examples of citizen science initiatives and how they support the objectives. The ACSA Project Finder is a web resource to discover more such projects, but also connects through appropriate metadata standards to international citizen science projects for a global view.

The ACSA Strategic Plan (Annex A) pillars of Participation, Partnerships, Practice, Impact, and Platform align strongly with the intent of the draft Strategy, and we believe the emerging convening power of ACSA as an

association and national community of practice(s) means we can play a role at the table of discussions on the implementation of a strategy for nature. From a government support perspective, continuing and expanding funding through program-specific citizen science initiatives, such as Inspiring Australia's citizen science grant is important. Similarly its support for community building, leadership, and convening organisations such as ACSA is essential. Government can also play a part in expressly recognising, mainstreaming, and articulating the contribution and role citizen science in key government policy agendas in a nature context – from the engagement of citizens with government, STEM education, the use of citizen science data by policy and decision makers, through to co-development of new innovations and businesses, and even health and wellbeing outcomes.

2. Importance of diverse partnerships in the draft Strategy

There is a tone across parts of the draft Strategy that "all Australians" equates to individual citizens and their associated actions and responsibilities. From a citizen science perspective this emphasis on the citizen is a given (along with supporting community organisations), but we recognise that in a nature context and noting the drivers impacting nature (e.g. climate change, invasive species, development) that other actors are essential for change including the business and private sector, and where perhaps there could be more emphasis in the draft Strategy. How we can build better partnerships with industry and businesses is an area of increased interest for ACSA and its members including government's role in facilitating this interaction. Similarly our commitment to science and policy outcomes means we are aiming to develop a community of practice at the government and government research agency level - citizenscience.gov being an exemplar in the US context.

3. An action inventory needs to be more than a showcase

An action inventory is a useful mechanism to understand how, not only government but also other actors, (e.g. citizen science) are delivering action against the Strategy goals and objectives. ACSA feels however, an action inventory is just the first step in being able to show outcomes or impact from action - an action or output is just part of an impact pathway for change. Understanding and connecting the metrics or indicators or measures associated with outputs-outcomes-impact from actions will provide greater value for the inventory than just a showcase, list, or catalogue. The ACSA community is also urging the need for a foundational piece of work to measure, track, and articulate the value and impact of citizen science in Australia to the triple bottom line of: society (e.g. well-being, quality of life), the economy (e.g. prosperity, jobs, businesses, efficiencies, innovation), and environment (e.g. ecosystem health, land quality, improved water quality). This would be particularly useful from the Strategy perspective as nature-related citizen science activities form a significant contribution in connecting with nature and sharing of environment and biodiversity data in Australia and a impact assessment/evaluation of this would be invaluable.

As an action inventory database (central, aggregated or federated?) is developed it needs to take into account existing and emerging platforms (e.g ACSA Project Finder, MERIT) as well as associated international metadata standards and interoperability – namely both technical and social architectures. ACSA would welcome the opportunity to participate in that database or platform development.

ACSA gratefully acknowledges and commends the work of the Department of the Environment & Energy and others in developing Australia's Strategy for Nature 2018-2030, and welcomes the opportunity to provide this submission on behalf of ACSA and the citizen science community of Australia.

Erin Roger (Chair) & Stephanie von Gavel (Vice-Chair) & Jennifer Loder (General Member) - on behalf of the Australian Citizen Science Association Management Committee
March 2018

STRATEGIC PLAN — Overview

Australian Citizen Science Association

	Participation	Partnerships	Practice	Impact	Platform
VISION	*A community that supports, informs and develops citizen science.*				
MISSION	*To advance citizen science through sharing of knowledge, collaboration, capacity building & advocacy for citizen science.*				
VALUES	• Inclusive • Inspiring • Empowering • Collaborative • Dynamic				
GOALS — *Message* "ACSA's Strategic Goals are to…"	*Encourage broad and meaningful participation in citizen science*	*through facilitating inclusive and collaborative partnerships*	*and a community of best practice, knowledge and tools*	*to ensure the value and impact of citizen science and its outputs are realised*	*enabled by ACSA as an effective, trusted and well recognised organisation and hub for citizen science in Australia."*
Outcome	*Individual & Community outcomes*	*Network outcomes*	*Capacity outcomes*	*Science & Education outcomes*	*Institutional outcomes*
Detail	Encourage & promote broad and meaningful participation of society in citizen science so people become partners in creating science & increasing science literacy.	Facilitate inclusive and collaborative relationships and networks with members and key community, science, education, government, and business partners, nationally and internationally, to deliver against common goals.	Support the development of tools, methods, infrastructure, and resources to strengthen the practice, use and study of citizen science.	Support & promote citizen science as an effective and innovative approach in undertaking and delivering research, and supporting science outcomes, including education and policy outcomes.	Establish ACSA as a well functioning hub and network for discussion, coordination, initiatives and advocacy, for members and to promote and deliver the goals of ACSA
ACTIONS	Participation	Partnerships	Practice	Impact	Platform
Year 1 (2015/16) Plan, Initiate	• *Develop communication & promote outreach activities via website & social media, building profile and awareness* • *Support national citizen science projects*	• *Develop membership framework & business model to grow a sustainable funding stream for ACSA* • *Identify strategic partnerships & networks and grow interactions*	• *Develop information management protocols and structures for information sharing* • *Create online project database and portal*	• *Hold a national conference* • *Support and promote strategic citizen science activities/projects on local, regional and national scales*	• *Incorporation* • *Governance - AGM & MC & working groups* • *Administration - host organisation & secretariat* • *Website & branding* • *Organisational plans*
Year 2 (2016/17) Build, Grow *(continued and built on by…)*	• *Target key sectors to increase participation in citizen science* • *Build awareness of citizen science through practitioner involvement in diverse fora*	• *Grow membership base & interaction* • *Build external partnerships grow international collaborations*	• *Recognise citizen science activities, including awards* • *Support the development of ACSA publications & reports*	• *Review and communicate broad impacts of citizen science*	• *Increase internal participation* • *Deliver citizen science advocacy at all levels e.g. champions* • *Increase visibility of ACSA*
Year 3 (2017/18) Deliver, Evaluate	• *Ongoing activities, including national conference* • *Evaluation of activities, including identification of gaps.* • *Review of plans, approach, strategy and improve as appropriate*				

ANNEX B

Citizen science is making and can continue to make valuable contributions to meeting the 12 objectives of Australia's strategy for nature 2018–2030, as the following examples demonstrate:

	Project examples
Objective 1: Encourage Australians to get out into nature	Citizen science represents an opportunity to connect people with nature in new ways. Ubiquity of mobile computing devices such as mobile phones and ipads afford citizen scientists the means to share observations nature and species occurrence. In addition to collecting powerful observations of nature, many apps also afford citizen scientists a means to collect images (e.g. Questagame, OzAtlas, iNaturalist) and/or audio (e.g. FrogID, Frog Census, eBird), which can help follow community members and experts verify observations, ensuring high quality scientific data for scientific research and biodiversity management outcomes. These mobile apps are often highly engaging and attracting people into nature.
Objective 2: Empower Australians to be active stewards of nature	Citizen science is one way to empower the community as stewards of their natural environment. Since 2014, annual ReefBlitz events have showcased coastal and marine citizen science programs in Queensland. New research (Dean et al 2018) indicates that community events such as this can foster environmental engagement and support stewardship outcomes. Event participants reported being willing to share information about reef conservation (91%); described increased support for marine science and conservation (87%) and reported intentions to adopt a new conservation behaviour (51%). Results suggested that highlighting environmental impacts, while providing meaningful experiences and building environmental citizenship skills, can support stewardship outcomes.
Objective 3: Increase Australians' understanding of the value of nature	Citizen science is being utilised to promote physical activity and the value of getting into nature, even in a urban context. The Stanford University Our Voice: Citizen Science for Health Equity framework includes work from Queensland to develop a strategy for engaging older people as citizen scientists. The project empowers them as agents of change in improving local built environments and ultimately advancing community health (Tuckett et al).
Objective 4: Respect and maintain traditional ecological knowledge and stewardship of nature	Citizen science offers a platform to integrate multiple scientific approaches, including Indigenous knowledge. 2017 Eureka citizen science prize winner the Indigenous Ngukurr Wi Stadi bla Kantri (We Study the Country) Research Team is working with Macquarie University to co-develop cross-cultural citizen science in south-east Arnhem Land to improve land management. To date, the project has revealed a new species of mammal, discovered populations of threatened species, preserved culturally important wetlands, and used eight local languages to record plants and animals. The Atlas of Living Australia has an Indigenous Ecological Knowledge (IEK) program of work that explores the role of information management platforms in bridging the boundaries between traditional and contemporary Indigenous knowledge and western science. In a collaborative approach, it aims to provide tools to enable and empower greater Indigenous participation in biodiversity information management and assessment, and to support other aspirations of Aboriginal and Torres Strait Islander people related to ecological or biodiversity knowledge.
Objective 5: Improve conservation management of Australia's landscapes, seascapes and aquatic environments	Tangaroa Blue Foundation coordinates a network of volunteers, communities, organisations, and agencies around the country to monitor and collect marine debris. In February 2018, their Australian Marine Debris Initiative Database held 10 million items of debris collected and documented littering waterways and coasts around Australia. By identifying rubbish types, they have been able to work with a range of partners to stop debris at the source. For example, Operation Clean Sweep works with industry to adopt better housekeeping and OH&S practices to reduce plastic litter during development and transport.

Objective 6: Maximise the number of species secured in nature	The provision of consistent, robust, and transparent approaches for assessing and listing species has been identified as a key action to protect and manage Australia's threatened species. Wildlife Spotter is an online citizen science project launched by ABC Science and other collaborators for National Science Week in 2016. Motion-sensitive cameras capture images of animals moving in the environment during both day and night, enabling researchers to keep an eye on their study sites 24 hours a day over extended periods of time. More than 50,000 people logged-in to process over 1 million images in a 2016 campaign. The project continues to report on distribution and abundance of threatened and iconic Australian wildlife through DigiVol, contributing to a long-term and accessible data record.
Objective 7: Reduce threats to nature and build resilience	The Threatened Bird Network (Birdlife Australia) has over 5,000 volunteers and supports community engagement, citizen science, data surveys and direct recovery management for over 30 threatened bird conservation projects. Note Birdlife Australia is the largest contributor of occurrence records to the national biodiversity information portal the Atlas of Living Australia with over 13M records (out of a total of 73M records).
Objective 8: Use and develop natural resources in an ecologically sustainable way	DuneWatch has been instrumental in combining citizen science and regeneration efforts. By monitoring 11 dunesites on a weekly basis over the past 4 years, dune health has been improved by including the data in revegetation techniques and coastal management.
Objective 9: Enrich cities and towns with nature	In November 2014 during the World Parks Congress Public Festival, over 500 children, scientists, naturalists, and World Parks Congress participants took part in the largest species audit of Sydney's Olympic Park. The BioBlitz proved a success as one of the first major public facing citizen science events run by the NSW Office of Environment and Heritage. Citizen scientists worked together to find, identify, and document as many species of plants, animals, and other organisms as possible using the iNaturalist app on their smartphones. Many of the invertebrate species were logged in that area for the first time ever.
Objective 10: Increase knowledge about nature to make better decisions	Citizen science can help fill data and knowledge gaps to support natural resource management decisions. In 2015 and 2016, a collaborative citizen science project to re-map key reef habitat areas in inshore Moreton Bay, Brisbane, was undertaken by Reef Check Australia, The University of Queensland Remote Sensing Research Centre, and Healthy Waterways and Catchments (Queensland Environmental Protection Agency in 2004). Trained volunteers collected benthic habitat field data used to validate and revise a 2004 coral spatial extent habitat map baseline. The data contributed directly to the Healthy Land and Water Report Card, helping to evaluate the effectiveness of catchment-level natural resource management investments and support evaluation of NRM project outcomes.

Another example includes Wild Orchid Watch, which is the first national observatory for all wild orchids in Australia. The project will partner scientists from the University of Adelaide with orchid enthusiasts to uncover information about Australian orchis and their habitats. An app is in development to assist citizen scientists collect data about orchids. |
| Objective 11: Share and use information effectively | Canberra Nature Map is an online platform for community discussions and recording of species in the Canberra region, with over 1,154,171 sightings of 4782 species across 648 locations from 1313 members. Local communities and regions are starting their own citizen science projects to capture and share information. Atlas of Life in the Coastal Wilderness is a sister-project based in the NSW South Coast, this project that has amassed over 190,000 records and 5,560 species identified. The platform ensures that information is made available for further research, including through initiatives such as "Bioblitzes".

Other examples of digital transformation in citizen science include:
• *Cat tracker* – using GPS tracking devices to track domestic cats to better understand more about cats, their behaviours, and their relationships with their owners, with over 4000 cats tracked in South Australia, and plans for a national survey of over 1400 cats - https://www.discoverycircle.org.au/projects/cat-tracker/ |

	Digivol – digitizing collections of specimen and object labels, and historical documents such as explorer journals to make them accessible for scientific and cultural research – through the power of over 2873 on-line volunteers with over 765,000 transcriptions undertaken to date - https://digivol.ala.org.au/ *EchidnaCSI* – collecting data via an app for citizen scientists to record echidna occurrences across Australia but also collect echidna scat for DNA analysis to understand echidna genetics, the plants in the environment, the echidna's food as well as their hormones that indicate stress or pregnancy - http://grutznerlab.weebly.com/echidna-csi.html. *Feralscan* – citizen surveillance of feral animals and biosecurity risks - https://www.feralscan.org.au/ *CoastSnap* - launched eight months ago in New South Wales but has since been replicated globally. CoastSnap uses fixed photopoints at beaches and provides a platform for image submission. Since its inception scientists have been able to establish a process to stabilise photos and use them to measure and monitor coastal change as well as additional information such as impact to shorebird habitat. This is one example of the potential of photopoints to inform management about change over time. -http://www.environment.nsw.gov.au/research-and-publications/your-research/citizen-science/digital-projects/coastsnap ACSA through its Data and Metadata Working Group and in collaboration with Europe and the USA, is working on the development of a PPSR-Core data and metadata standard to establish interoperable data and metadata sharing arrangements, which will enable the various international citizen science project catalogues to federate their respective project lists into a single searchable catalogues and also to encompass metadata for datasets, observations and data transfer protocols. This group is also liaising with other initiatives in the mainstream science domains which are also involved in activities aligned with observational data, metadata and/or standards work. These include the ICSU WDS, CODATA, RDA (Research Data Alliance), GBIF, TDWG (Taxonomic Data Working Group), Australian relevant NCRIS facilities, relevant state agencies, and others.
Objective 12: Effective measurement to demonstrate our collective efforts	Reviewing and monitoring the effectiveness of our citizen science in changing attitudes and contributing to scientific knowledge helps better understand what makes great citizen science and delivers meaningful outcomes for nature. The Discovery Circle engages a range of innovative approaches for evaluating citizen science including consulting psychologists to design communications, understand motivations, and achieve meaningful outcomes. RiverScan is a project run by North Central Catchment Management Authority (NCCMA) which uses citizen science to provide baseline and ongoing assessment of river health across several catchments in northern Victoria. Importantly, this data is used to track progress against the objectives of NCCMA's Native Fish Recovery Plan which include: 'reducing pollutant loads entering waterways', 'improving and maintaining water quality' and 'restoring and maintaining key ecosystem processes'. Each year the project releases an Annual River Health Snapshot Report that will highlight changes in ecosystem health of these waterways using citizen science data. In combination with other data collection techniques, RiverScan data plays an important role guiding waterway management decisions and demonstrating management outcomes.

Examples of jobs and businesses ("prosperity") built around citizen science, especially in the nature based digital economy:

- *Stuart Harris* – a personal transformation story - from garbage collector and amateur photographer to citizen scientist discoverer of new species of peacock spiders, completing study in environmental monitoring, to a job at Questacon as Team Leader of the Questacon Live Exhibit Officers - http://iview.abc.net.au/programs/maratus/IV1732H001S00#playing
- *NatureMapr* – software platforms supporting communities - http://naturemapr.org/NatureMapr
- *Spatial Vision* – cloud based and app development services - http://www.spatialvision.com.au/citizenscience/
- *Questagame* – gamification and the use of AI in citizen science – https://questagame.com/home
- *Gaia Resources* – data collection systems and support - https://www.gaiaresources.com.au/