NATIONAL BUSHFIRE RESPONSE

THE ROLE OF CITIZEN SCIENCE

April 2020

CSIRO

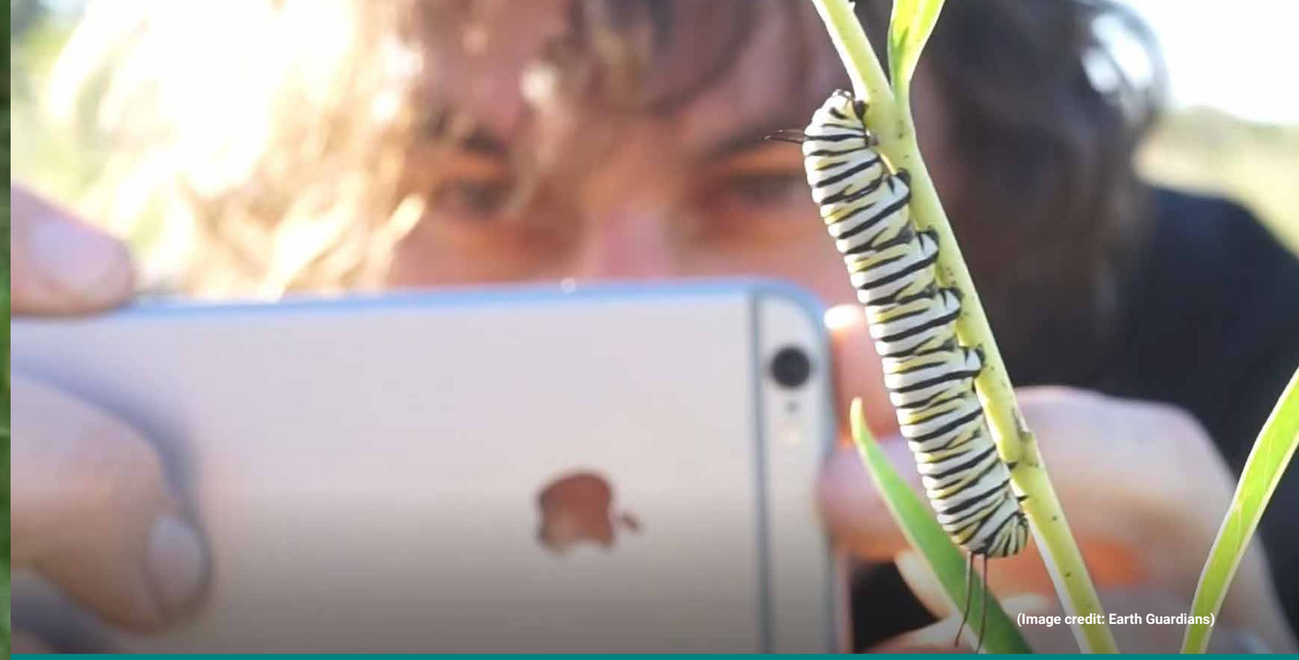
Australian Citizen Science Association

Atlas of Living Australia
ala.org.au

NCRIS
National Research Infrastructure for Australia
An Australian Government Initiative

> In a time of crisis, research capability is under pressure and citizen science provides an important complement to traditional research-led monitoring and recovery campaigns.

(Image credit: Earth Guardians)



(Image credit: Earth Guardians)

Background

On January 15th, in response to the bushfires impacting Australia, Minister Karen Andrews, Minister for Industry, Science and Technology recently convened a roundtable of scientists and experts to frame a science-led response. One outcome from this roundtable was the recognition that considerable energy and capability exists in the citizen science community, providing a complimentary resource and opportunity to increase both the scale and impact of research-led responses. CSIRO was asked to lead a process to identify opportunities for the public to meaningfully engage with scientists in collaboration with citizen science projects, thereby maximising the likelihood of these activities delivering science-ready data.

The result of this process includes a series of short-term deliverables in response to the initial requirements of the sector, and longer-term recommendations informed by the discussions held at two complementary bushfire response citizen science forums. Recommendations will be used to inform ongoing discussions within CSIRO and Government regarding our national response to the bushfire crisis.

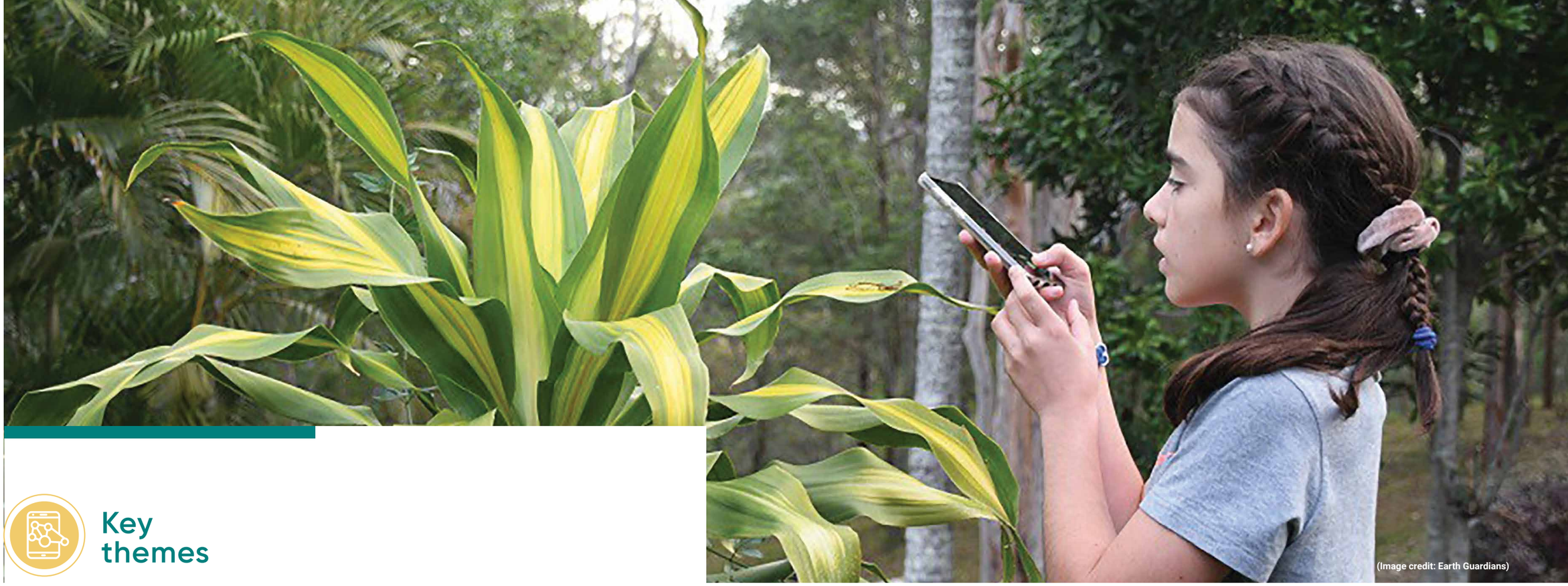
Citizen Science Forum

On 14 February, CSIRO hosted the first national forum bringing together key stakeholders to explore how the sector could be supported and coordinated to help deliver research-ready data. Sectors represented included research, state and commonwealth government, non-government organisations, industry and the citizen science sector represented by the Australian Citizen Science Association (ACSA). The list of participating organisations is provided on page 7.

Objectives of the forum included:

- Share ideas and discuss opportunities for how the science and citizen science sectors could work together around a common goal.
- Identify immediate opportunities to support the sector through the current bushfire response and recovery phase.

The scope of the forum included the natural (e.g. biodiversity, air, water) and built environment and social elements.



(Image credit: Earth Guardians)

Key themes

Participants were encouraged by the role of citizen science in supporting our nation's bushfire response, and recent events have precipitated a timely conversation between the professional and citizen science communities. Citizen science capability in response to the bushfires takes two general forms including (a) individuals living in proximity to bushfire affected areas can participate by collecting field data and observations, and (b) the broader national and global community can be engaged to help classify, interpret and validate data. The Australian Museum-led **DigiVol** capability was provided as an example of the latter.

> This approach would encourage and promote broad and meaningful participation of society in citizen science, so people become partners in creating science.

The forum recognised that in a time of crisis, research capability is under pressure and citizen science provides an important complement to traditional research-led monitoring and recovery campaigns. Albeit triggered by our 2020 bushfire crisis response, the ensuing COVID-19 global crisis has further cemented the importance and potential of citizen science as an enabler. Two short term actions were proposed: a) communication of data acquisition fundamentals (e.g. preferred field protocols, data collection ethics etc.), tools available for data acquisition, and optimum repositories for citizen science data enabling maximal re-use; and b) communication by the research sector to highlight current citizen science projects providing robust information that contributes to the understanding of bushfire recovery and resilience.

Longer term objectives included the collaboration of researchers and communities to up-scale projects and to identify new opportunities and gaps in existing knowledge, enabling meaningful contribution from the public.

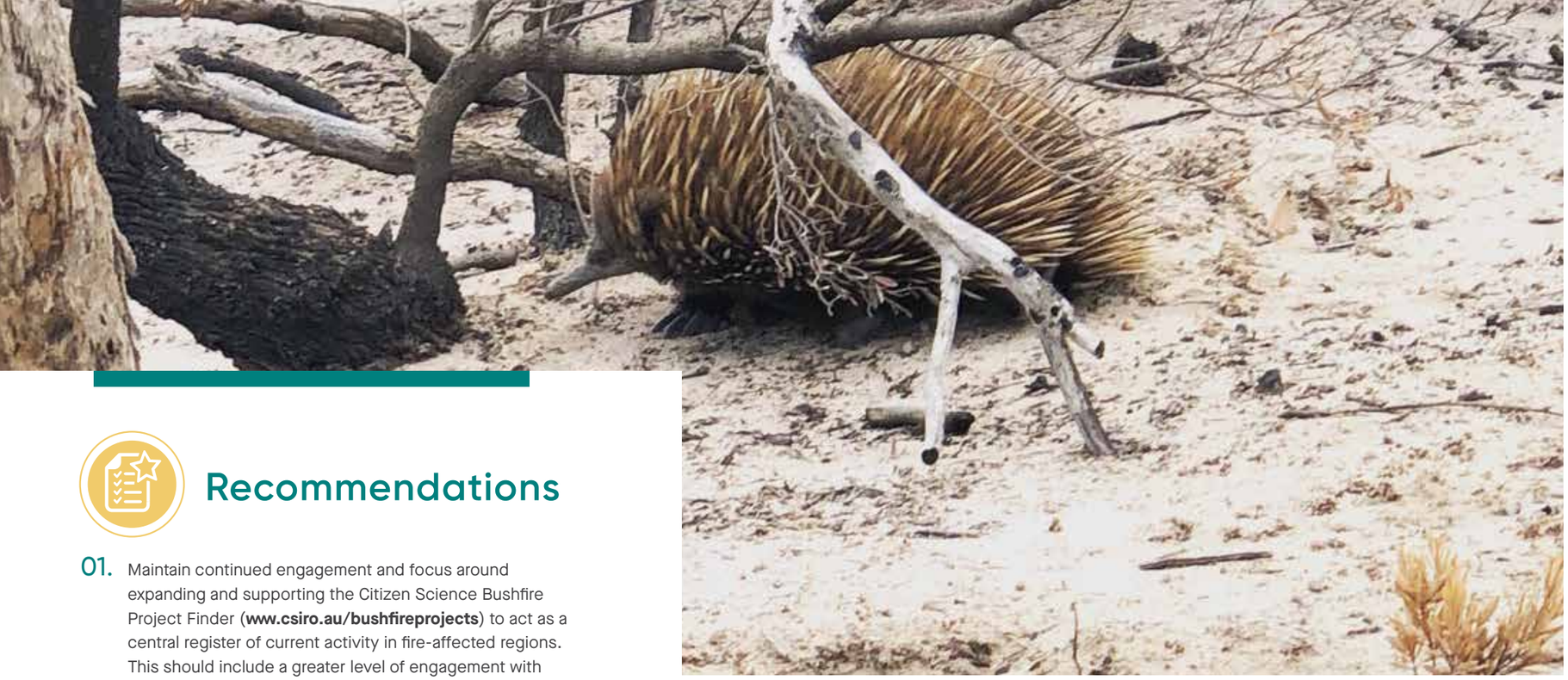
The forum also explored potential risks which includes physical risk to citizen scientists prematurely entering hazardous areas, in addition to ethical considerations with regard to human and animal observations. The research sector has mature policies for dealing with ethics in experimental design and this knowledge would deliver significant value to the citizen science sector.

The science community noted that greater collective benefit could be derived by aligning field protocols to deliver to multiple science questions, for example botanical data captured to answer ecological questions could also support calibration of remotely sensed imagery. Finally, the forum noted that the greatest science benefit is to embed citizen science capability and energy within a research-led experimental design supported by strong partnerships between both sectors. This approach would encourage and promote broad and meaningful participation of society in citizen science, so people become partners in creating science thus increasing science literacy and the democratisation of expertise.

Short term deliverables

In addition to two national forums designed to bring together key stakeholders and develop these recommendations, this initiative also delivered two immediate deliverables. These include:

- The Citizen Science Bushfire Project finder was developed and launched through the collaboration of the CSIRO, Atlas of Living Australia and the Australian Citizen Science Association. This acts as a first step in building awareness of the range of bushfire-related citizen activities currently underway. The project finder can be accessed at **www.csiro.au/bushfireprojects**
- An online hub was developed by CSIRO to act as a repository for current and future citizen science resources. This is available at **www.csiro.au/citizenscience**



Recommendations

01. Maintain continued engagement and focus around expanding and supporting the Citizen Science Bushfire Project Finder (**www.csiro.au/bushfireprojects**) to act as a central register of current activity in fire-affected regions. This should include a greater level of engagement with jurisdictions, research teams and related organisations (e.g. regional natural resource management organisations, NGOs) that have an interest in working with the citizen science sector.

02. Establish an enduring function at the Commonwealth level which will facilitate on-going productive partnerships in science and mutual learning between research scientists and the community. Core elements of this function would include:

- Provide guidance to the citizen science sector on best practices including field protocols and methods, survey protocols, experimental design, data collection and documentation, and analysis.
- Deliver a communication and outreach function to promote the collaborations occurring across the science/citizen science interface and uplift the capability of the citizen sector to complement formal research programs.
- Improve coordination between Commonwealth and related jurisdictional activities in the citizen science space.
- Highlight and showcase existing citizen science projects which exemplify collaborative scientific activities focused on bushfire recovery and resilience.
- Suggest project ideas which could help to fill gaps in bushfire recovery and resilience knowledge.

03. Provide a mechanism for the Australian research community to more effectively engage with the citizen science sector early in research project design and delivery.

04. Complete or document illustrative case studies that showcase best-practice integration of formal science research programs and citizen science capability and support this with a communication campaign.

05. Provide support to peak bodies that represent the citizen science sector, for example through the Australian Citizen Science Association and related organisations.

06. Ensure that existing Commonwealth citizen science-related programs operate in a more coordinated manner to help deliver on the national goal of producing research-ready data. Opportunities also exist to align citizen science programs with broader science-led programs, as well as related Commonwealth strategies and objectives.

07. Identify a suite of preferred data acquisition tools to ensure that data from the citizen-science sector is collected in a structured and supported manner providing data to key national or international data repositories.

08. Identify a suite of preferred desktop tools that can leverage the energy of the sector to support desktop transcription, classification and analysis of data to support science needs. This would extend the sectors awareness of initiatives comparable to DigiVol.

09. Develop guidelines for the citizen science sector to help communicate key aspects of ethical research practice and risk, particularly in the context of bushfire response and recovery.

10. Recognise that any solution developed in response to the bushfire crisis should deliver benefit to other research needs, for example for disasters such as flood or non-hazard related applications (e.g. human health).

Contributing organisations

Australian National University, Fenner School of Environment and Society

Atlas of Living Australia

Australian Citizen Science Association

Australian Museum

Australian Space Agency

Australian Trust for Conservation Volunteers (SA/ Vic/ NSW/ Tas)

Birdlife Australia

Border Ranges Alliance

Bushfire Recovery Victoria

Council of Heads of Australasian Herbaria

Council of Heads of Australian Faunal Collections

CSIRO

Department of Agriculture, Water and Environment (Cth)

Department of Environment and Water, South Australia

Department of Environment, Land, Water and Planning, Victoria (Cth)

Department of Industry, Science, Energy and Resources (Cth)

DigiVol

Earth Guardians

Ecological Society of Australia

Geoscience Australia

Greening Australia

Integrated Marine Observing System (IMOS)

Naturemapr

Office of the Chief Scientist (Cth)

Office of the Chief Scientist, Queensland

Queensland Museum

Queensland University of Technology

Questacon

Terrestrial Ecosystem Research Network (TERN)

University of Adelaide

University of New South Wales

Further information

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