Science for Saving Species

Research findings factsheet

Project 6.5

Threatened Species Recovery Hub

National Environmental Science Programme

How citizen science programs are implemented in Australia for threatened species

Data collection for every threatened species

A review of citizen science programs in Australia has found over 130 different programs with relevance for threatened species listed on the EPBC Act.

Of these, there are five that provide a tool or infrastructure to support volunteers to collect and submit data about species across all taxonomic groups. While not explicitly focused on threatened species they allow for the collection of data on all threatened species. This is critical for the majority of threatened species, which do not currently benefit from specialised citizen science programs.

Two of these five are government supported programs; Atlas of Living Australia (Australian Government) and BowerBird (Museum Victoria). The remaining three are administered by large non-governmental organisations (NGOs); DigiVol (Australian Museum), iNaturalist and Questagame.

Identifying the research questions to be answered

There are several existing frameworks which outline key steps for the establishment of a successful citizen science program. One of the first steps, across all frameworks, is to identify the research question/s that can be answered with the assistance of citizen scientists. When we examined this among our reviewed programs, we found that only 2% state specific research questions on their websites or in communications to potential participants (Figure 1).

In contrast, approximately 86% state their aims or objectives, at least broadly. Despite some organisations not articulating their aims or objectives, all activities conducted tend to be designed to achieve one or both of the following; increasing our understanding of the species or threatening process affecting the species (95%), or increasing education or engagement with the species or science more generally (28%).

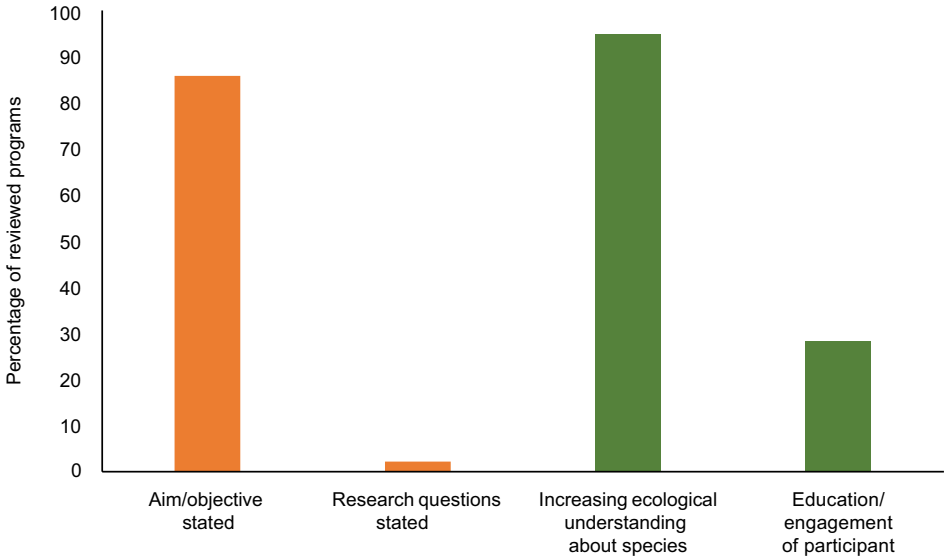

Figure 1: Percentage of programs that state their aims or articulate a research question (orange columns) and the most common aims for programs (green columns).

The University Of Queensland AUSTRALIA
CHARLES DARWIN UNIVERSITY
Australian National University
RMIT UNIVERSITY
CSIRO
birdlife AUSTRALIA

Image: Matt Clancy Wildlife Photography

The Growling Grass Frog (Litoria raniformis)

Programs like Melbourne Water's 'Frog Census' app and the Australian Museum's 'FrogID' app encourage participants to submit data in areas where threatened species, like the Growling Grass Frog, are likely to occur. Both programs offer citizen scientists the chance to capture data about frogs using incidental observation techniques, helping to build a more complete picture about where threatened (and unthreatened species) continue to persist.

When programs are implemented

While the timing of citizen science activities varies across the different programs reviewed, the majority, are designed to receive input from the public on a continuous basis (69%) (Figure 2).

iNaturalist, eBird and a number of state government and council data portals are good examples of programs that facilitate members of the public sharing data about threatened species they observe to a large and centrally managed data repository at any time.

Just over 20% of programs run seasonal events, with activities capturing data quarterly or bi-annually. Often this is to coincide with seasonal cycles for the species in question. For example, projects focusing on Humpback Whales and many shorebirds can only occur during the season they are present in Australia.

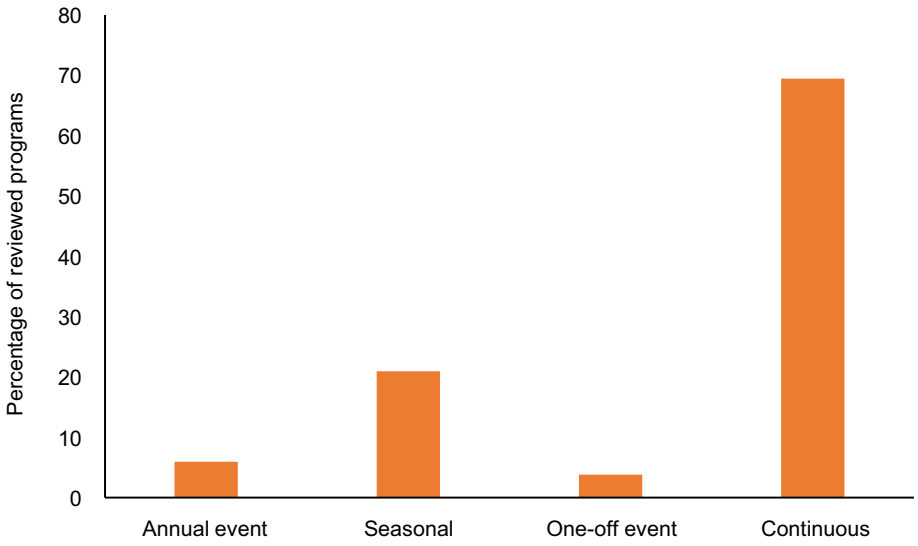

Figure 2: Timeframes that citizen science activities are conducted.

Shorebird Surveys. Image: Chris Purnell

What activities citizen scientists are undertaking

Our review found four broad categories of activities that citizen scientists undertake which contribute to threatened species conservation.

1. Targeted direct observation of species
2. General monitoring in habitat (with the potential for direct observation)
3. Habitat restoration activities
4. Monitoring or managing the agent of decline for a threatened species

The most popular type of activity (55%) involves recording direct observations for a particular threatened species, or a group of threatened species (e.g. migratory shorebirds). The remaining activities are not focused on targeting threatened species per se, but offer a high (Figure 3) likelihood of increasing our understanding of threatened species. For example, there are several citizen science projects focused on frogs. While most frogs are not threatened, because these programs focus on habitats where threatened frogs are likely to occur, they were included in our study.

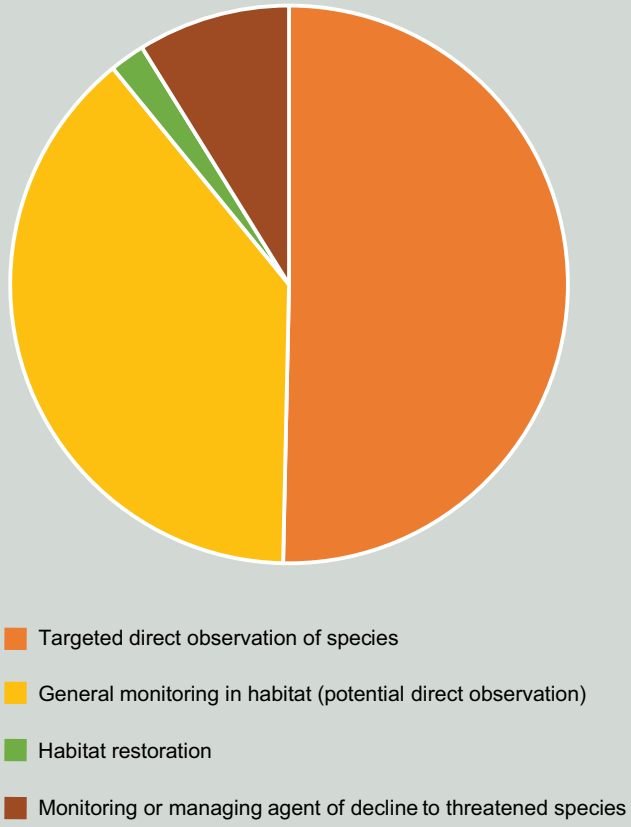

Figure 3: Type of activity that volunteers participate in.

Birders observing birds as citizen scientists

The Australasian Bittern and numerous threatened shorebirds that migrate to Australia each year are among the species that have benefitted greatly from surveys conducted by citizen scientists across Australia. BirdLife Australia's Shorebirds 2020 and Bittern Projects have yielded important information about these species' populations and movement patterns. These species live in habitats that are not always easy to survey, illustrating the dedication and commitment of these volunteers to collect rigorous data fit for high level recommendations to government regarding the species' conservation status.

Image: Andrew Silcocks

Standardised versus incidental monitoring

Much criticism of citizen science programs stems from the lack of rigorous methodologies used to obtain data that can answer clearly defined research questions. However, our review has found that while there is a significant proportion of data derived in this opportunistic manner (63%), there is also a substantial amount of effort put into programs which collect data in a more robust and standardised way (48%) (Figure 4).

In fact, many programs that allow data to be uploaded as incidental data also have the infrastructure in place to be able to collect data using more scientifically preferred methods. For example, BirdLife Australia has very rigorous methods for surveys to be included in the Atlas of Australian Birds (via Birdata), however there are several programs that they take incidental or opportunistic data for, including locations of roosts and watering sites for Black-cockatoos in South West Australia as well as occurrence data for Australasian Bittern.

In the case of very large datasets derived from incidental data, there are still opportunities to answer important questions about species presence or absence at large scales as well as responses to environmental changes, when those data are collected over longer time scales. State wide government administered Atlases and eBird are prime examples of these large datasets that can be useful for answering broad scale questions to aid in managing threatened species. For example, Australasian Bittern monitoring yielded information on range contractions that resulted in the species being uplisted to Endangered.

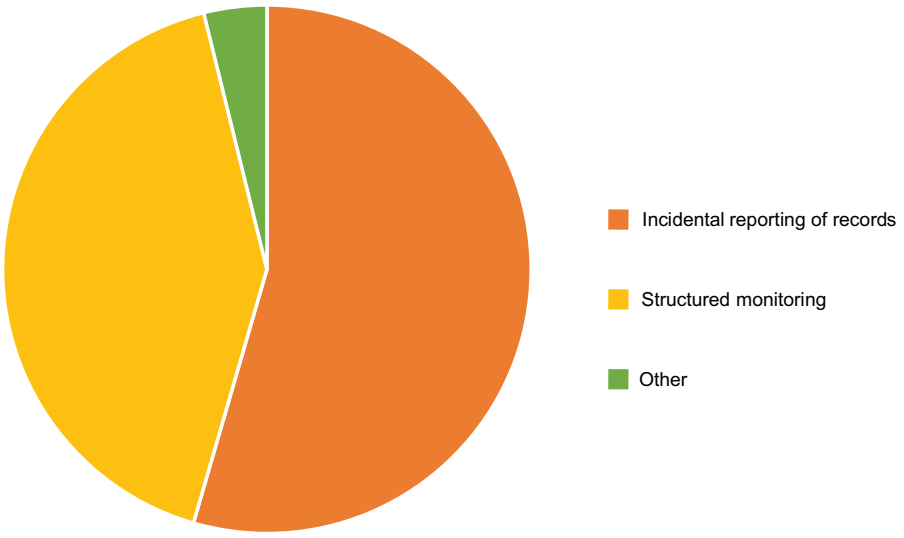

Figure 4: Methodological approach to volunteer activities.

Further Information

For more information about this TSR Hub research, contact Rochelle Steven: r.steven@uq.edu.au or visit our website at http://www.nespthreatenedspecies.edu.au/

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