

ARC Centre of Excellence for Environmental Decisions (CEED)

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Let's hear it for citizen scientists!

Citizen science is booming in Australia, revealing previously unknown features of the continent and saving governments a ton of money.

"There's a nationwide trend towards scientific reporting by skilled amateur observers, especially among young Australians," says Professor Hugh Possingham, Director of the ARC Centre of Excellence for Environmental Decisions (CEED).

"For the first time we are starting to build up a truly extensive picture of the state of the Australian environment – and are able to watch how it changes over time."

One of the drivers of the boom in amateur science is the spectacular growth in use of mobile devices, Prof. Possingham says. "These mean that birdwatchers, for example, can record lists of the birds they see on their smart phones and tablets, and file them on a central database, which can then be instantly interrogated by scientists."

With access to online scientific libraries containing images and sounds of wildlife, the quality of amateur observation is also improving in leaps and bounds, he adds.

Between them, birdwatchers in Australia are filing around 8000 reports every month of the birds they see in the web site Eremaea eBird (<http://ebird.org/content/australia>). Around 4 million individual bird records have accumulated in just a few years.

"It's not just the rare species, which everyone seems to assume are the most important. We are getting a much better understanding of the seasonal movements of common birds like the willie wagtail and budgerigar," says Dr Richard Fuller, a CEED and University of Queensland scientist who is analysing citizen science data.

"These actually tell us far more about what is happening in the environment than does the occasional sighting of a rare or unusual bird – though those are also good to know about," Dr Fuller adds.

Prof. Possingham says it would otherwise take scientists decades to amass that sort of data, at a cost to the taxpayer of anything from \$10-50 million a year. "So this work by citizen scientists is of real national value in both ecological and economic terms – and needs to be encouraged."

With about 7000 avid birders spread across the continent, Australian bird research is well served, compared with our understanding of other fauna such as frogs, reptiles and mammals.

"The data on these other Australian animals is very patchy compared with birds – though some birders also report butterflies and other wildlife – so the next challenge is to build equally strong

networks of citizen scientists willing to go out in the bush, observe and report on them,” Prof. Possingham says.

Small marsupials, in particular, represent a special challenge because of remoteness, scarcity and their secretive behaviour.

“There was a time when a lot of Australians were insect lovers – and they helped establish the great national collections. But now, apart from butterflies, amateur entomologists are few and far between,” he says.

“Since there are many insect species still left to discover in Australia this is an area in particular need of encouragement.

“We also need to keep better track of our frogs, in view of evidence for a worldwide decline in frog species.”

Prof. Possingham adds that one area that tech-savvy citizen scientists can be of particular assistance is by setting camera or sound traps in the bush to record wildlife movement, sounds and behaviour when no humans are present, and in helping to assess the results.

“For example if we had acoustic monitors at every weather station, we would effectively be able to cover the entire continent for calls made by bats, birds and frogs. Some of these calls can now be analysed and identified using special software, so the system can be almost automatic.”

Dr Ayesha Tulloch, a research fellow at CEED, recently showed that the return on investment of citizen science programs can be high. “A network like this, especially if supported by citizen science, could give us the first true picture of life across the whole of Australia, as it happens and as it changes – for a probable cost of only \$2 million per annum. That is very inexpensive science to understand an entire continent.”

Prof Possingham says Australia should pay tribute to its citizen scientists for the tremendous contribution they are making to understand the current state of Australian wildlife, but also in helping protect the heritage of Australians into the far future by keeping an eye on what happens to native fauna today.

CEED is the Australian Research Council Centre of Excellence for Environmental Decisions. CEED’s research tackles key gaps in environmental decision making, monitoring and adaptive management.

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