

### Ten years, ten birds; crucial citizen contribution

An international team of citizen scientists and researchers (including from ARI) identified a major contributor to the dramatic decline of migratory shorebird populations in Australia. Citizen scientists collected data from 1993–2012, on 10 key species, and what they found was dramatic. Australian shorebirds are under threat due to the degradation and destruction of mudflats thousands of kilometres away in north-east Asia. The mudflats were identified as the most important factor in the birds' decline.

*"Without this effort, the study would have been impossible."*

Associate Professor Richard Fuller (University of Queensland)

Studds, C. E., Kendall, B. E., Murray, N. J. et al. (2017) Rapid population decline in migratory shorebirds relying on Yellow Sea tidal mudflats as stopover sites. Nature Communications 8

### Project ideas

The wide variety of projects that could involve citizen science for DELWP, include those that:

- collect data to improve our knowledge of the distribution of species, and the models derived from this information
- evaluate the effectiveness of habitat improvement works
- collect data on plants to inform models of ecosystem function in relation to disturbance (e.g. fire)
- monitor sites, over long-time frames, to track changes in species abundance
- involve anglers and others in collecting data on fish populations, fish movement and catch success
- record the occupancy, effectiveness and maintenance standard of nest boxes
- undertake social surveys on connections (values and actions) between people and nature
- engage people currently disconnected with nature, especially in cities, to collect data such as sound (bioacoustic) data or to record flowering
- establish remote cameras and screen images for key information (e.g. for pest animals at high biodiversity value sites)
- transcribe high value data from a range of sources, such as naturalists' notebooks, into information systems.



### Anglers and fish scientists working together

An ARI-led project on the Murray River (2007–2014) investigated native fish population responses after reinstatement of woody habitat. The project included an important citizen science component. Angler diaries complemented the conventional fish monitoring program and anglers also collected otoliths (fish ear bones), used to analyse fish age and growth. The anglers' contribution of about a third of the otoliths analysed in the project was invaluable in this scientific research.

Lyon, J. et al. (2014). Monitoring of resnagging between Lake Hume and Yarrawonga: Final Report 2014. ARI Unpublished Client Report for the Murray-Darling Basin Authority, The Living Murray Program, DELWP.



### Links

There are many links to citizen science projects and resources. Some key links include:

**Atlas of Living Australia** — [www.ala.org.au/get-involved/citizen-science/](http://www.ala.org.au/get-involved/citizen-science/)

**Australian Citizen Science Association** — [www.citizenscience.org.au](http://www.citizenscience.org.au)

**BirdLife Australia Citizen Science** — [www.birdlife.org.au/get-involved/citizen-science/meet-our-citizen-scientists](http://www.birdlife.org.au/get-involved/citizen-science/meet-our-citizen-scientists)

**SWIFFT** — [www.swifft.net.au/](http://www.swifft.net.au/)

**Victorian Environment Friends Network** — [www.vnpa.org.au/page/volunteer/victorian-environment-friends-network](http://www.vnpa.org.au/page/volunteer/victorian-environment-friends-network)

**Reefwatch** — [www.vnpa.org.au/programs/reefwatch/](http://www.vnpa.org.au/programs/reefwatch/)

**Bowerbird** — [www.bowerbird.org.au/](http://www.bowerbird.org.au/)

**Citizen Science Alliance** — [www.citizensciencealliance.org/](http://www.citizensciencealliance.org/)

**Citizen Science Central (Cornell)** — [www.birds.cornell.edu/citscitoolkit](http://www.birds.cornell.edu/citscitoolkit)

**CitSci.org** — [www.citsci.org/cwis438/websites/citsci/home.php?WebSiteID=7](http://www.citsci.org/cwis438/websites/citsci/home.php?WebSiteID=7)

**iNaturalist** — [www.inaturalist.org/](http://www.inaturalist.org/)

Or type in citizen science and explore. You can also explore the "Watches": ClimateWatch, ReefWatch, EstuaryWatch, WaterWatch, Earth Watch...

### Further Information:

**Office location:** Arthur Rylah Institute for Environmental Research, DELWP, 123 Brown Street, Heidelberg, Victoria, Australia 3084

**Mail address:** PO Box 137, Heidelberg, Victoria, Australia 3084

**Phone:** +61 3 9450 8600

**Website:** [www.ari.vic.gov.au](http://www.ari.vic.gov.au)

**Email:** [research.ari@delwp.vic.gov.au](mailto:research.ari@delwp.vic.gov.au)

### Citizen science in DELWP:

*DELWP's citizen science for biodiversity program involves volunteer citizens collaborating with scientists to enhance knowledge, and support management, of Victoria's biodiversity.*

## Citizen Science: You and Nature

Arthur Rylah Institute for Environmental Research



Environment,  
Land, Water  
and Planning





## Citizen Science: You and Nature

*Citizen Science is a powerful way for people to connect with nature, help protect nature, learn new things, improve diverse skills, and meet like-minded people. Citizen science involves volunteers, in partnership with scientists, participating in scientific projects.*

### Citizen science turns ordinary, and extraordinary people, into scientists

Citizen science is growing rapidly around the world, including in Australia and Victoria, and many projects are helping us learn more about biodiversity and how we can better protect nature. The extraordinary advances in technology in recent years have vastly increased the potential for people everywhere to collect, manage, share and analyse data. This means interested people can easily join in and collect valid, accurate, very useful information, and collaborate on scientific projects. Volunteers do not need to have science backgrounds to participate as citizen scientists. Citizen science takes many forms. Projects can be initiated and planned by scientists, by citizens or both, in a co-created or co-designed approach. Current Victorian projects cover a wide range of activities, including training and support, and happen in terrestrial, freshwater and marine environments.

The Arthur Rylah Institute for Environmental Research (ARI) has been involved in citizen science for many years and we are now keen to expand our citizen science program. We are also keen to research citizen science itself, and learn how to get more people involved; connecting with nature and helping support nature.

## Citizen science in Victoria

Citizen science is not a new idea. Aboriginal people, and more recent citizens, have a long history of observing and managing our nature.

Governments have also been involved for many years. The first government botanist and director of the Royal Botanic Gardens, Baron Ferdinand von Mueller, established a wide network of citizen plant collectors throughout the State, and interstate, during the 1800s, building a collection of herbarium specimens for scientific research. There are many examples of highly valuable, long-term studies initiated and undertaken by citizens, including:

- the Sherbrooke Lyrebird Survey Group: 50 years of studying Lyrebird biology and threats in the Dandenong Ranges
- the Victorian Wader Study Group: 40 years of data on waders and bird migrations, helping underpin important international agreements to protect shorebirds.
- ReefWatch: Scuba divers are monitoring marine fish, invertebrates and algae. The data they collect helps improve our management of marine environments and learn more about the effectiveness of marine parks.
- Birdlife Australia: over the past 20 years more than 7000 volunteers have done over 420,000 surveys, comprising over 71 million bird records. This information tells us how birds are faring across the country and helps us understand which species are at risk. A new Birddata app makes contributing simple.
- FungiMap: volunteers have collected thousands of records of fungi and increased our knowledge of fungal distribution and status. This is essential for conservation planning and management.

These efforts are making a tremendous difference, but much more needs to be done if we are to manage our complex Victorian ecosystems with confidence.



## Why Citizen Science?

Getting involved in scientific research means Victorians can become far more than passive recipients of the outcomes of research; they can be integrally involved in the science process and learn about the natural world. Citizen science is a powerful way to ‘democratise’ science.

**For people**, citizen science means:

- widening friendships and social networks, and having fun
- doing something meaningful and worthwhile
- getting new skills and knowledge (or getting great satisfaction using existing skills)
- feeling the health and wellbeing benefits of nature
- forming a deep connection with nature and natural places
- a great sense of achievement
- gaining a greater understanding of how research contributes to government decisions and actions.

**For science**, getting more people involved in research means:

- more data, from more people, over a wider area
- linking with highly skilled people in the community
- increased community ‘scientific literacy’
- increased awareness or visibility of biodiversity issues or projects
- hearing more about different perspectives, thinking, values and priorities from a wide range of people
- potentially learning more about nature on private land
- a wider, shared approach for the important work of protecting our environment.

## Citizen Science and DELWP

The recent launch of Victoria’s 20-year Biodiversity Plan: ‘*Protecting Victoria’s Environment – Biodiversity 2037*’, coupled with the escalation of smart technologies, provides a timely context for the Department of Environment, Land, Water and Planning (DELWP) to explore and embrace citizen science; for people and for biodiversity.

Citizen science can contribute directly to DELWP’s objectives in the Biodiversity Plan, particularly those aiming to connect people with nature and protect biodiversity. Citizen science can also increase the collection of targeted data for evidence-based decision-making, raise awareness of the importance of the natural environment and develop a shared approach to supporting biodiversity.

*Nature is good for people, and more people understanding and supporting our environment is good for nature.*

*Through citizen science, we can build new relationships between people, science, governments and nature.*



## Creating a great program

A DELWP citizen science program requires careful planning to help ensure projects are effective, robust and meaningful to the department’s priorities.

An effective citizen science **program** should:

- appoint a co-ordinator(s) with appropriate skills, experience and enthusiasm
- prioritise knowledge gaps and filter them for citizen science project suitability
- design a diverse suite of projects, attractive to people
- provide support and advice to volunteers wanting to design and conduct their own citizen science projects
- collaborate with behaviour change scientists and partners in the citizen science sector to increase participation
- evaluate the program experimentally to determine the value of the collected data, extent of people acting for nature, and ways to improve future activities
- create a ‘resources hub’ containing support documents, links and ideas.

## Creating a great project

Citizen science **projects** work best when they:

- are a good ‘fit’ for the scientific task
- are meaningful and scientifically rigorous
- are equitable; with benefit for both scientists and volunteers
- Involve strong, genuine and diverse partnerships
- are open, accessible, fun and safely achievable
- are communicative and involve frequent feedback
- are adequately resourced
- have clear tasks, with appropriate training
- are transparent and ethical
- are thoughtfully evaluated
- are visible, shared and celebrated.



### A ‘Where’s Lori?’ story:

This citizen science project, designed by Monash University students and ARI, asked people to upload photos of Rainbow lorikeets and their nesting sites. ‘Where’s Lori?’ helped people ‘see’ nature they hadn’t even noticed before:

*“...We have lived on our block for 15 years and never took much notice of the birds before your project. We have so many! I’m quite obsessed with them now...”*