



UNSW AUSTRALIA

# A New Frontier in Tracking Waterbird Movements and Wetland Health



Kate Brandis<sup>#\*</sup>, Debashish Mazumder<sup>#</sup>, Richard Kingsford<sup>\*</sup>, Suzanne Hollins<sup>#</sup>

<sup>#</sup> Australian Nuclear Science Technology Organisation <sup>\*</sup> Centre for Ecosystem Science, UNSW

## Background

- Water resource development across Australia is impacting on wetlands by reducing flows and frequency of flooding.
- Wetland habitat loss has resulted in fewer opportunities for breeding by waterbirds.
- As a result there have been long term declines in waterbird populations, particularly in the Murray Darling Basin.
- When wetlands flood waterbirds congregate in large numbers to breed.
- Following breeding, waterbirds disperse across the landscape and utilise a range of different wetlands until the next opportunity for breeding. Where they go and which wetlands they use is a key question for wetland and water management.



## Key Objectives

- To track waterbird movements around Australia using stable isotopes and elemental analysis.
- Develop a 'Feather Map' for Australia to identify patterns of waterbird movement.
- To inform water policy development for the management of wetlands for waterbirds.



## Methods

Feather collection from around Australia using targeted sampling and citizen science.

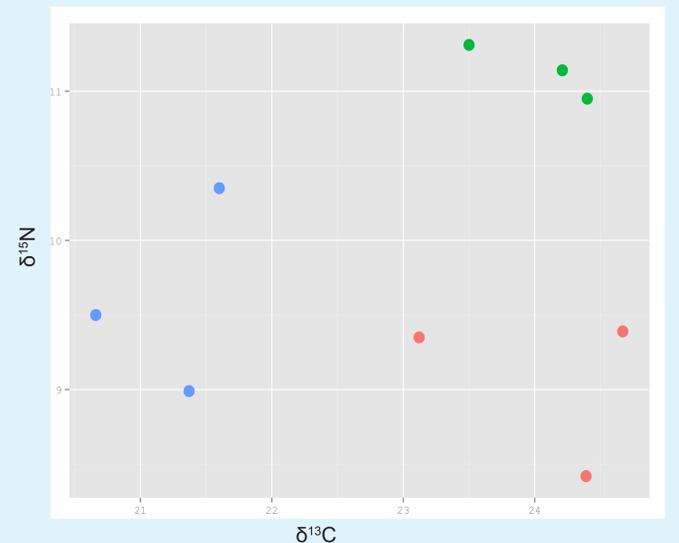
Stable isotope analysis for  $\delta^{13}\text{C}$ ,  $\delta^{15}\text{N}$ ,  $\delta^{18}\text{O}$  and  $\delta^2\text{H}$ .

Elemental analysis using ITRAX-XRF scanner. A non-destructive method providing optical and spectrometry elemental profiles of the feather including Si, P, S, Cl, K, Ca, Ti, Fe, Cu, Zn, As, Sn.

Sampling during breeding events to determine natal site characteristics and wetland health.



## Results



Results of initial stable isotope analysis (plot) of three juvenile feathers from three different wetland sites in the Murray Darling Basin (light blue shading on map). Red dots -Barmah-Millewa Forest, green dots -Lowbidgee Wetlands, blue dots -Gwydir Wetlands.

## Citizen Science: Feather Map of Australia

### Feather Map



- ANSTO and UNSW are supporting this new initiative to encourage people from across Australia to post in feathers.
- The feathers will be analysed and their data included in the creation of a feather map.
- The feather map will provide a baseline of isotopic and elemental values found in feathers. The feather map can then be used to identify the origin of birds at wetland sites.

