



Tracking waterbirds to quantify their use of wetlands that receive environmental water.

Aim

To develop a clearer understanding of waterbird mobility, the locations of breeding activity and the environmental characteristics (i.e. habitat elements) of successful breeding locations.

Background

The success associated with using environmental water to achieve biodiversity benefits in wetlands depends on our understanding of the linkages and relationships between inundation events and/or regimes and populations of species. For waterbirds there are likely to be many complex steps involved, since populations respond indirectly to water, through the effects of this water on various aspects of their habitat.

An analysis of data from waterbird monitoring during WetMAP Stage 3 found that the relationship between wetland inundation events and waterbird breeding was a key knowledge gap. Too little breeding was observed in watered wetlands to be able to sustain waterbird populations. Tracking of key waterbird species was recommended, to test the hypothesis that whilst waterbirds may feed, rest and roost in wetlands that receive environmental water they breed at other locations. Breeding success is a critical component of the population dynamics of Australian waterbirds, providing recruits into adult populations.

Remote tracking of waterbird movements in Australia has indicated the need for large landscape-scale thinking and planning for environmental watering (e.g. Murray-Darling Basin scale). Movement behaviour varies between and within waterbirds species, including resident, nomadic and migratory behaviours. The habitat needs for waterbirds to forage may also vary during and between breeding events.

Wetland monitoring and assessment program for environmental water

Research questions

To what extent do waterbirds that use WetMAP bird monitoring sites, especially those receiving environmental water, breed elsewhere (at local, regional and/or continental scales)?

Sub-questions:

- Where do the waterbirds found in environmentally watered wetlands breed?
- What structural habitats are used by breeding waterbirds?
- Are the structural habitats used by breeding waterbirds different to structural habitats in environmentally watered wetlands in Victoria?
- Do structural habitats used by breeding waterbirds have different inundation requirements to environmentally watered wetlands of Victoria?
- Are there other local or regional contextual differences between the wetlands where waterbirds breed and the wetlands managed with environmental water in Victoria?

Approach

Species selection and remote tracking

Species were selected, based on the preferences of environmental water managers and the feasibility and appropriateness of tracking (e.g. size, catchability, threatened status, cost and management implications). These include:

- Whiskered Tern, Pied Stilt and Red-necked Avocets (30 trackers)
- Australasian Shoveler and Freckled Duck (30 trackers)
- Brolga (five trackers)
- Sharp-tailed Sandpiper (five trackers).

This tranche of species complements other waterbird tracking studies occurring in eastern Australia. In addition to addressing the research questions above, for species such as Sharp-tailed Sandpiper, information will be gained regarding their use of wetlands which receive environmental water for other parts of their life cycle.

Birds will be captured during their non-breeding period, and GPS/GSM transmitters will be harness-mounted. This will enable birds to be tracked throughout their annual cycle, including breeding locations and behaviour.

Data collection and field work

Data to be collected will include:

- waterbird movement and breeding/nesting behaviour
- detailed structural habitat characteristics associated with waterbird breeding attempts
- hydrology of breeding sites, including historic and recent water regimes, inundation event characteristics and recent dry intervals.

Field surveys will confirm breeding and include habitat structural assessments.

Data analysis and modelling

A database will be developed, and modelling undertaken to compare the structural habitat characteristics, inundation regime and landscape context of locations and times of detected breeding events with non-breeding locations and times.

This project will include collaborations with the Game Management Authority and the University of Western Sydney, to increase sample sizes and fieldwork efficiency.

Timeline August 2022 - June 2025

This project is viewed in a longer-term perspective, given the complexities associated with tracking waterbirds, and the need to gather and analyse sufficient data to inform management of environmental water for waterbirds.

Outputs

- Brief **Field Survey Updates** will be distributed to key stakeholders after each field trip.
- **Annual Reports** will summarise progress, preliminary observations and results and planned future actions.
- A **Final Report** will be produced, outlining the project background, methods, results, discussion and recommendations for management.

Outcomes

- Quantification of the breeding activity of selected waterbirds within watered wetlands, as well as at a local, regional and/or continental scale.
- Improved understanding of the structural habitat characteristics used by breeding waterbirds.
- Advice for managers to inform seasonal and annual watering decisions to benefit waterbirds.

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A Brolga (foreground) and Black Swans