WetMAP Stage 4 Waterbirds

Waterbird habitat and water



Understanding the habitat requirements of waterbirds and the water regimes needed to support this habitat.

Aim

To develop a clearer understanding of the linkages and relationships between aspects of a wetland water regime, including environmental watering, and benefits to waterbird populations through providing suitable habitat.

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.

Improving the availability of habitat for waterbirds is a common objective for environmental flow management in many Victorian wetlands. Data analysis from waterbird monitoring during WetMAP Stage 3 found that many waterbird species respond quickly and strongly to environmental water in wetlands, with increases in abundance and species richness. However, the relationships between structural habitats used by waterbirds and how these are influenced by environmental water are not well understood. How particular environmental watering actions affect habitat components, such as vegetation structure and water depth requires further investigation.

Data analysis from waterbird monitoring during WetMAP Stage 3 also showed that some areas within wetlands were used extensively by different waterbird species, especially deep open water, shallow open water and bare wet exposed substrate. Habitat associations often varied by different guilds and species. Birds were frequently observed feeding or loafing/resting in these habitat types, but observations of breeding were extremely rare. For most waterbird species, their general foraging and breeding habitat preferences are known at a coarse scale. There are significant gaps in knowledge regarding how wetland use for feeding and resting is influenced by regional and local contexts as well as seasonality.

Wetland monitoring and assessment program for environmental water





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Research questions

We seek to fill key knowledge gaps on how environmental watering actions can influence waterbirds by changing their immediate physical surroundings and related structural habitats, through three research questions:

1. What is suitable structural habitat (vegetation and substrate) for waterbird life functions (e.g. feeding, resting, nesting and breeding)?

2. Taking into account wetland depth, what are the water regimes (i.e. frequency, duration, magnitude and timing) required to provide the structural components of habitats used for waterbird life functions?

3. To what extent are waterbirds using their suitable structural habitat components for their life functions?

Approach

This project is proposed to occur in two steps.

Step 1 - Defining structural habitat for waterbird species and guilds

Data review and analysis

Data collected in the previous stage of WetMAP will be analysed in detail to provide novel insights into the associations between waterbirds and different elements of structural habitat. This will involve analysis of the numbers of birds present on surveys and how this relates to habitat availability at wetlands. Finer-scale analyses will also be made of the habitats in which waterbirds were observed during surveys, and those that different species used for feeding.

This work will include a supplementary literature review, collaboration with similar Australian research and consultation with waterbird experts.

Step 2* - Determining the water regimes needed to provide structural habitats for waterbird species and guilds, and their usage of these habitats

The aim is to use Step 1 data to inform future research. Step 2 could involve field surveys and data collection regarding waterbirds, structural habitat characteristics and wetland hydrology features. The selection of wetlands for surveys, the variables measured and the monitoring methodology would be determined at a later date. The possibility of using data obtained by the associated waterbird tracking project could also be examined. This kind of data may be particularly suitable for examining habitat preferences of waterbirds at night, when direct observation is not possible.

Habitat types and indicators could be developed for their optimal relevance to bird ecology and population biology. This could build on Water Regime Indicator Groups (WRIGs) which were developed for the vegetation theme in WetMAP Stage 3. Variables may include the features, height and density of vegetation (including riparian, submerged and above-water); water depth; connectivity of vegetation; extent and wetness of mudflats; and distance to nearest above-water vegetation.

Modelling would then be undertaken to quantify relationships between hydrology, structural habitats and bird use variables. This would consider variability at both the local and landscape scale, the influence of seasonality, and also explore the linkages between locations across wetlands and landscapes.

Timeline

Step 1 (Aug 2022-Mar 2023) Step 2* (Apr 2023-Sept 2024)

Outputs

Step 1

• A compendium of structural habitat requirements by species for Victorian wetland waterbirds.

Step 2*

• 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.

*subject to funding

Outcomes

• An updated knowledge framework to support improved management of environmental water for waterbird outcomes in wetlands.

 Improved understanding about waterbird habitat needs, the inundation regimes required to meet those habitat needs, and the limits to which water management is sufficient to meet those needs.

• Advice for managers to inform seasonal and annual and longer term watering decisions to benefit waterbirds.

Key Contact Dr Nyil Khwaja (Bird theme lead, Project lead), Arthur Rylah Institute.



Pied Stilts and Sharp-tailed Sandpipers





2

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