
MONITORING WATERBIRD ACTIVITY IN MILLEWA FOREST: 2017 – 2018



Monitoring Waterbird Activity in Millewa Forest 2017-18

Report Title: Monitoring waterbird activity in Millewa Forest: 2017-18

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Front cover photo: St Helena Little Pied Cormorant chicks and nests (A.Borrell)

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SUMMARY

Murray Valley National Park possesses known colonial waterbird nesting sites. Monitoring of waterbird breeding events has been undertaken in the forest since 1999. During the 2017-18 water season, environmental water was delivered to Millewa Forest throughout spring and summer which inundated 25% of the forest. A portion of this water was allocated to Reed Beds to support waterbird breeding. This report presents the results of the intervention monitoring program undertaken for waterbird breeding during the environmental flow event.

One aerial survey was conducted in January by New South Wales National Parks and Wildlife Service (NSW NPWS). The aim of this was to ensure that colonial waterbird nesting sites weren't present in any wetland areas that couldn't be accessed on ground. Colonial nesting waterbirds were recorded breeding at two wetland sites within the National Park and one site adjacent to the park, on the Murray River. The total number of breeding pairs recorded in the forest was ~491. The number of breeding pairs on each wetland supporting nesting colonial waterbirds were:

- St Helena Swamp – 142 pairs; and
- Reed Beds wetland complex (North and South) - ~250 pairs
- Picnic Point (not on park) – 85 pairs

Eight colonial nesting species were recorded nesting:

- Australian white ibis *Threskiornis molucca*;
- royal spoonbill *Platalea regia*;
- Eastern great egret *Ardea modesta*;
- Intermediate egret *Ardea intermedia*;
- Nankeen night heron *Nycticorax caledonicus*;
- Little black cormorant *Phalacrocorax sulcirostris*;
- Little pied cormorant *Microcarbo melanoleucos*;
- Australasian darter *Anhinga novaehollandiae*.

Over the spring and summer, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) was undertaking the third and final year of a study for the Environmental Watering Knowledge and Research (EWKR) project in Millewa's Reed Beds. This project has involved setting up remote cameras around nesting areas to assess the nesting behaviour of colonial nesting waterbirds.

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To minimise disturbance to nesting waterbirds, NSW NPWS limited visits to Reed beds throughout the nesting season. CSIRO provided on the ground reports throughout the season regarding nesting stages to assist with watering actions. As per the objectives outlined in the basin plan, this breeding event was a successful fledgling event and was able to sustain breeding of colonial and migratory waterbirds.

1. INTRODUCTION

The Barmah–Millewa Forest is in the central Murray Valley between the towns of Tocumwal, Deniliquin and Echuca. The forest has been identified as one of the icon sites under the Murray Darling Basin Authority’s ‘The Living Murray’ (TLM) program. The icon site totals 66,600 ha in size. The Millewa portion of the icon site is reserved as the Murray Valley National and Regional Parks comprising of the Millewa, Moira and Gulpa Island precincts (hereafter called Millewa Forest). Millewa Forest covers an area of 41,957 ha comprising of Inland Riverine Forests, Inland Floodplain Woodlands, Floodplain Transition Woodlands, Riverine Sandhill Woodlands and Inland Floodplain Swamps (Keith, 2004).

During flood events, the Inland Floodplain Swamps are known to support large numbers of waterbirds including colonial nesting species (e.g. egret and ibis species). Large waterbird nesting events have been recorded within Millewa Forest since early in the 20th century (Mattingley, 1907, 1908). Although these breeding events still occur, they are much smaller in size compared to historical events (Maher, 1993) and occur less frequently (Leslie, 2001). This has been attributed largely to removal of water from within the Murray River system.

A water recovery initiative was developed as part of the TLM program. The water recovered as part of this initiative is then available for use within the icon sites to achieve ecological objectives as outlined in the Environmental Water Management Plans for each icon site. The environmental water release included the delivery of 5.6 gigalitres (GL) of targeted TLM environmental water delivered through Millewa Forest regulators and 6.7 GLs delivered into Reed Beds which allowed waterbird fledging to reach a successful completion. This report presents the results of the intervention monitoring program undertaken during this flood/environmental flow event.

Main Objectives:

As Millewa is recognised as a historically important waterbird breeding ground, it is imperative that conditions in Millewa continue to promote waterbird breeding, with the aims of maintaining and improving waterbird population abundance and resilience. The purpose of intervention monitoring is to locate colonies and monitor their extent, abundance and richness over the breeding season, informing management decisions. Many factors will contribute to waterbird breeding success, with water levels being one critical factor that can be controlled within these wetlands. Sudden drops in water level can cause waterbirds to abandon their nests, and potentially abandon their young, greatly reducing the effectiveness of watering actions which aim to promote ecological outcomes and increase waterbird populations.

Aims of waterbird monitoring in response to breeding events:

- Ensure that waterbird colonies can be supported throughout the season.
- Collect data to contribute to an extensive body of data that has been collected over 20 years, to inform targets and progress over this time and feed into long term monitoring programs.
- Communicate status of waterbirds and ecological outcomes to stakeholders over the season.
- Quantify success of management actions in real time.

2. METHODOLOGY

2.1 *Study Sites*

The sites included in the intervention monitoring project were based on:

- on-ground surveys conducted as part of the TLM condition monitoring;
- aerial survey was undertaken to determine extent of flooding and location of colonial waterbird breeding colonies; and
- New South Wales National Parks & Wildlife Service (NSW NPWS) staff knowledge.

During spring 2017 and summer 2018, waterbird monitoring was conducted at three sites where colonial nesting waterbirds were identified as breeding. The three sites were (Figure 1):

- St Helena Swamp;
- Reed Beds
- Picnic Point colony

Surveys were carried out from October to March. As CSIRO were also undertaking surveys in Reed Beds North, NSW NPWS conducted limited surveys in Reed Beds North than it normally would have if CSIRO were not conducting their project work, to limit the exposure of the nesting birds to disturbance.

2.2 Survey Methodology

To count and identify waterbirds on individual wetlands, a survey transect or a survey point was established. A single traverse of each transect starting and finishing at the survey point was completed for all wetlands except Reed Beds North (west). At Reed Beds North (west) each survey was undertaken from the bird hide located on the northern shore of the wetland. Each transect was located to survey as much of the waterbird breeding colony as possible while being undertaken in a manner so as to not unduly disturb the nesting birds. Survey transects were completed from a boat, kayak or on foot depending on the depth of water present within each site. The group of birds known as waterbirds contains many species. For the purposes of this monitoring study species from the following families were considered waterbirds:

- Anatidae (Swans, Geese, Ducks);
- Podicipedidae (Grebes);
- Anhingidae (Darters);
- Phalacrocoracidae (Cormorants);
- Pelecanidae (Pelicans);
- Ardeidae (Hérons, Egrets, Night Herons, Bitterns);
- Threskiornithidae (Ibises Spoonbills);
- Accipitridae (Hawks, Harriers);
- Gruidae (Cranes);
- Rallidae (Crakes, Rails, Gallinules);
- Scolopacidae (Snipe, Godwits, Curlews, Sandpipers, Stints, Phalaropes);
- Recurvirostridae (Stilts, Avocets);
- Charadriidae (Plovers, Dotterels, Lapwings);
- Laridae (Gulls, Terns)
- Halcyonidae (Sacred Kingfisher *Todiramphus sanctus*)
- Alcedinidae (Azure Kingfisher *Alcedo azurea*); and
- Slyviidae (Old World Warblers).

All waterbird species observed on the wetland or flying over were recorded. If a species was breeding then the number of nests, eggs and chicks were also recorded. Surveys were conducted at each site approximately every three weeks throughout the season.

3. RESULTS

One aerial survey was conducted by National Parks on the 17th of January 2018. Breeding had been sporadic over spring, and this was to ensure that any waterbird breeding colonies weren't being overlooked. Waterbirds had reportedly abandoned from nesting in sites in Barmah over December holidays. The aerial surveys identified small groups of ibis and spoonbills nesting in north and south reed beds, and a small number of Eastern great egrets nests could be seen at Picnic Point.

Due to the density of the vegetation within the wetland complex, it is difficult to accurately assess nesting numbers from the ground. Photos taken on the aerial surveys allowed estimates of nesting colonial waterbirds to be made within the Reed Beds wetland complex as the entire wetland complex was not accessible on ground. These estimates were used to determine the total number of colonial nesting waterbirds utilising the wetland.

A total of eight species were recorded nesting in Millewa's wetlands and on the Murray river. Pair numbers were established through both ground surveys and aerial estimates. Species recorded breeding were:

- Australian white ibis – 148 pairs * (Reed Beds)
- Royal spoonbill- 102 pairs* (Reed Beds)
- Little pied cormorant– 125 pairs (St Helena)
- Little black cormorant –17 pairs (St Helena)
- Australasian darter – 14 pairs (St Helena, and Reed Beds South)
- Eastern great egret– 15 pairs (the Murray, at Picnic Point)
- Intermediate egret – 3 pairs (the Murray, at Picnic Point)
- Nankeen night heron – 67 pairs (the Murray, at Picnic Point)

*Estimates from EWKR project monitoring.

4. DISCUSSION

In the 2017/18, flows were much more limited than in the previous year. However, Barmah-Millewa received flows throughout spring that inundated 25% of the forest (Kuo and Thomas, 2018). Wetlands were monitored throughout the season, and environmental water was used to ensure that spoonbills which had eggs in February could successfully fledge their young.

Use of environmental water for other colonial waterbird nesting events in Millewa has occurred in 2000-01 (5,008 pairs NSW only, 335GL), 2005-06 (5,421 pairs, 513GL), 2010-11 (7,420 pairs, 428GL) (Webster 2012), 2015-16 (1,098 pairs, 375GL) (OEH, 2016), 2016-17 (2,828 pairs, 290 GL) and 2017-18 (491 pairs, 439GL).

- Due to the increase in waterbird breeding numbers, an extension of three weeks was delivered via the Gulpa Creek offtake regulator to maintain water levels suitable for the breeding event to reach successful conclusion, by encouraging adult birds to remain with nests and young. Most of colonial nesting waterbird chicks had fledged by mid-February 2018, a month later than would usually be expected. Extended watering also provided ideal refuge conditions for juvenile waterbirds to remain at the site over the following autumn-winter, which allow young birds to strengthen, escape predators and reach maturity to become the next cohort of breeding adults.



Figure 1: Australian White Ibis with small chicks, in February (Credit: EWKR Waterbird Project 2018)

- Based on the regular field observations, Australian white ibis began nesting in late November with eggs and chicks being produced throughout December-late February with nestlings fledging throughout January and February. Royal spoonbills formed nest platforms

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during late-October to December. Eggs were present from mid-November to mid-February and chicks were present from early January to late February and fledging through to early March.

- Large numbers of immature birds were still present within the wetland complex into March taking advantage of foraging habitat being revealed as water levels receded.
- Straw-necked ibis were spotted flying in groups around the wetlands early in the season, however none were recorded nesting. Flood volume, duration, timing and availability of nesting habitat are all important factors in determining successful breeding by straw-necked ibis. (Brandis et al. 2011; Merritt et al. 2016)
- The EWKR project carried out nest monitoring from with motion-sensing cameras from October – March and via fortnightly on-ground monitoring November – February (McGuinness, pers comms).
- This event also provided habitat for the Australasian bittern *Botaurus poiciloptilus* and Australian little bittern *Ixobrychus dubius* (likely breeding based on calling behaviour). Across Barmah-Millewa, 50 male Australasian bitterns were recorded with 10 of those recorded calling in the Reed Beds, Coppingers Swamp and Duck Lagoon complex.
- It also provided foraging habitat for nesting Eastern great egrets *Ardea modesta*, Intermediate egrets *Ardea intermedia*) and Nankeen Night Herons (*Nycticorax caledonicus*) in an egret/heron colony present along the Murray River, near Picnic Point.
- Nankeen Night herons bred at picnic point in small numbers this year, alongside eastern great egrets. The colony was surveyed on the 19th of December, and later that day a severe wind storm hit the region. Surveys were then conducted in January and found that the number of nesting pairs had significantly decreased. This may have been due to the wind storm. This is the second year in a row they nested along the Murray, with the breeding event 5 times bigger last year. It does show that they can breed in years with smaller inundation extents.
- Cormorants and darters nested in St Helena, in mature red gums, thick saplings and newly established trees. A small number of darters were recorded nesting in south reed beds in March (very late in the season) with small chicks. The cormorants were well established by the end of October, with all nests checked having eggs or very small chicks. By January, there were immatures starting to fledge from nests. This correlated nicely with the watering regime, as by the time water levels were dropping, many of the cormorants had fledged.
- A white-bellied sea eagle nest with one chick was recorded in St Helena in January.
- A pair of Peregrine falcons were observed in St Helena, hanging around a potential nest site.

Conclusions

This waterbird breeding event was a small event with fewer species recorded nesting this year than last year. Lower water heights across the wetlands and a lack of water in other areas around the Murray-Darling basin may have influenced breeding patterns this year. St Helena continues to provide reliable nesting conditions for cormorants and darters, whilst south and north reed beds had modest numbers of white ibis and royal spoonbills nesting.

Basin Plan Annual Rolling Priorities applicable to Millewa Waterbirds

Waterbird Basin Annual Environmental Priorities 2017-18 (Moderate Waterbird Outcomes)				Met?
Maintain Ecological Resilience and Health	Maintain waterbird breeding habitat in 'event ready' condition	WF4		✓
Ensure environmental assets maintain their basic functions and resilience	Waterbirds: Trigger and provide on-going support for small scale breeding across functional groups (moderate-wet)	WF5		✓
Maintain ecological health and resilience	Create a mosaic of wetland habitats suitable for functional feeding groups	WF6		✓

Waterbird Ecological Outcome	Objective Met?	How?
Promote and/or sustain successful breeding events for thousands of colonial and migratory waterbirds in at least 3 years in 10 by inundating selected floodplain and wetland areas to provide suitable nesting and feeding habitat.	Met	As breeding has occurred six times in the last ten years, this objective has been met. Three of those events had sizeable colonies that had thousands of colonial waterbirds.

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