

# A baseline study of the birds of Tahlee and surrounds (north-western Port Stephens, New South Wales)

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Surveys for birds in a c.100 ha site on the north-western shore of Port Stephens New South Wales during 2014 – 2018 recorded 167 species. The core study area was located at Tahlee although the surveys also included parts of adjacent areas of Port Stephens shoreline and woodlands bordering Karuah Nature Reserve to the west and private property to the north. The study had two main objectives: to establish baseline data about the species occurring in the Tahlee area and to foster interest in citizen science amongst residents and visitors to the property.

Fourteen species classified as threatened under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) or the *Biodiversity Conservation Act 2016* (NSW) were recorded in the surveys. Regulars amongst these were Osprey *Pandion haliaetus* and White-bellied Sea-Eagle *Haliaeetus leucogaster* as breeding residents, Beach Stone-curlew *Esacus magnirostris* and Bush Stone-curlew *Burhinus grallarius* the latter of which sometimes roosted on the property, Australian Pied Oystercatcher *Haematopus longirostris* and Glossy Black-Cockatoo *Calyptorhynchus lathami*. Species such as Blue-faced Honeyeater *Entomyzon cyanotis* and White-bellied Cuckoo-shrike *Coracina papuensis* were recorded more frequently in the study area than is the case in other parts of the Hunter Region.

## INTRODUCTION

The Tahlee property (“Tahlee”) lies on the north-western shore of Port Stephens. Nearby areas include the village of Carrington to the east and Karuah Nature Reserve to the west (see **Figure 1**). Tahlee itself has a noteworthy history. The 75-ha property was first developed in 1826 by the Australian Agricultural Company, as their initial headquarters. Various changes occurred in the first 50-60 years, including substantial clearing along the shoreline to Carrington. The changes culminated in plantings of pine trees and other exotic plants in the 1880s under the direction of Mr Robert (HD) White. Since then, most of the site has been undisturbed. The adjacent woodlands in the Karuah Nature Reserve also are undisturbed now, although formerly it was a State Forest.

The Tahlee owners have recognised the property’s conservation values and intend to manage it accordingly. That prompted the present study which had as a main objective the development of baseline information about the species present on the property and some conveniently accessed adjacent areas, comprising a total survey area of c. 100 ha. Other objectives were to find opportunities for education through citizen science, and to

identify locally significant bird species that could become the basis for future specific studies.

## METHODS

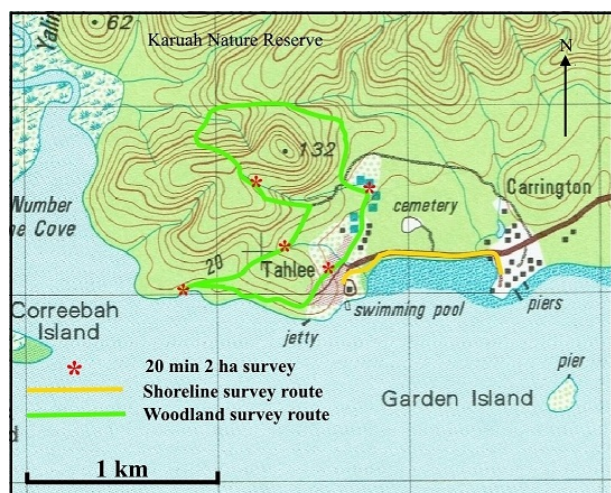
### The study area

Tahlee and its surrounds have a combination of woodland, grassland and estuarine habitats (Ecological Australia 2015), with some patches of garden around the main settlement. Altitudes range from sea level to 132 m. There is considerable undulation, which creates runoff that forms several gullies with flows into catchment dams and small natural wetlands that provide habitat for waterbirds. There are several walking tracks that allow safe access in most weather conditions.

Much of woodland area of Tahlee, the adjacent private property and Karuah Nature Reserve is sclerophyll forest (Ecological Australia 2015). The predominant species are eucalypts, notably Grey Ironbark *Eucalyptus microcorys*, Swamp Mahogany *Eucalyptus robusta*, Forest Red Gum *Eucalyptus tereticornis*, Tallowwood *Eucalyptus siderophloia* and Spotted Gum *Corymbia maculata*. There also are several species of

*Allocasuarina*. Introduced species include Lantana *Lantana camara* and African Olive *Olea europaea africana*.

The Tahlee shoreline is part of the Port Stephens – Great Lakes Marine Park. There are large tracts of mangroves. At low tide, exposed mudflats provide foraging habitat for shorebirds many of which roost at nearby Gir-um-bit National Park (Stuart 2004).



**Figure 1.** Location of the Tahlee property on the north-west shore of Port Stephens

## Survey methods

This baseline study began in July 2014 and spanned a four-year period to June 2018. The main survey effort involved a fixed-route walk along bush tracks in the study area. The route was chosen to be easily repeatable while maximising the area covered. These surveys were carried out by the author or some other experienced surveyor, sometimes accompanied by a small number of other observers. They were conducted once per week, on Wednesday mornings regardless of the weather conditions. They commenced shortly after dawn and required about three hours to complete. All species heard or seen were recorded, and results were entered in the BirdLife Australia National Atlas Birddata as 500-m Area Surveys.

The fixed route incorporates four 2-ha sites, each of which was surveyed separately, in each case recording all species encountered in a 20-minute interval. The 2-ha sites were selected such as to sample a range of habitat types in the overall survey area. For the purposes of this report, results from the four 2-ha surveys have been included into the 500-m area survey.

Additional 500-m radius Area Surveys were sometimes carried out, designed to cover a subsection of the property for more specific studies, such as the mudflats at low tide for shorebirds, or forest areas when in blossom or fruiting. These surveys were less structured and often had larger participation, involving local community members and visitors. Results from shoreline surveys of the area between Tahlee and Carrington have been included in this report.

## RESULTS

In the four-year period July 2014 to June 2018, 263 surveys were conducted, producing records of 167 species. Of those, 128 species were recorded in the sclerophyll forest areas, the rich floral diversity providing good habitat for a range of woodland birds. The neighbouring shoreline with mangrove, mudflat and estuarine/marine habitats supported an additional 39 species. **Table 1** shows the number of surveys conducted in each season and the number of species recorded. Appendix 1 (available at [www.hboc.org.au/the-whistler-volume-13/](http://www.hboc.org.au/the-whistler-volume-13/)) lists all species recorded and their overall and seasonal Reporting Rates (RR).

**Table 1.** Surveys in the Tahlee study area July 2014 to June 2018

	Summer	Autumn	Winter	Spring	Overall
No. of surveys	66	64	83	50	263
No. of species	131	140	129	137	167

Thirty species, listed in **Table 2**, had Reporting Rates (RR) of 50% or greater. These may be considered the common birds of Tahlee. However, 92 species had overall RRs above 10%, which is an indication of the high species diversity occurring in the study area. The RR is the ratio of number of records to number of surveys, expressed as a percentage.

The other 76 species included several cryptic species which probably were under-recorded, such as White-throated Nightjar *Eurostopodus mystacalis*, Australian Owlet-nightjar *Aegotheles cristatus* and Powerful Owl *Ninox strenua*.

## Threatened species

Fourteen species were recorded that are classified as threatened under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) or the *Biodiversity Conservation*

*Act 2016* (NSW) (Roderick & Stuart 2016). These are listed in **Table 3**. Four of them had only 1-2 records. The other species appeared to be resident or regular visitors to the study area.

Australian Pied Oystercatcher *Haematopus longirostris* was a regular visitor at low tide. In early 2018 a juvenile was seen several times with parents foraging on the mudflats. A pair of Bush Stone-curlew *Burhinus grallarius* was often recorded although infrequently in summer (**Table 3**). One had a metal band and thus could be identified as having hatched near Bobs Farm in 2009 (A. Morris pers. comm.). The Beach Stone-curlew *Esacus magnirostris* was recorded once in spring surveys, foraging on the mudflats in the study area. Probably it was of one of the pair which regularly breeds on Dowardee Island (T. Murray pers. comm.). Dowardee Island is just 6 km from Tahlee across open water.

The White-bellied Sea-Eagle *Haliaeetus leucogaster* and Osprey *Pandion haliaetus* were breeding residents. A pair of the latter has been breeding at the same nest annually for over a decade. During breeding seasons, it was an amazing sight to see the species interact; most notably the intolerance the Osprey (and the Whistling Kite *Haliastur sphenurus*) had for the Sea-Eagle. Osprey, White-bellied Sea-Eagle and Whistling Kite were the main raptors in the study area. The Osprey was recorded more often in winter/spring than in summer/autumn (**Table 3**).

### Migratory shorebirds

Eight migratory shorebird species were recorded in the surveys, as listed in **Table 4**. The most common of these were Eastern Curlew *Numenius madagascariensis* and Bar-tailed Godwit *Limosa lapponica*, recorded in every season, and the Grey-tailed Tattler *Tringa brevipes* which was absent in winter.

### Breeding species

During the study period 18 species had one or more confirmed breeding records (nest with eggs or young, or adults were observed feeding recently fledged young). These were: Tawny Frogmouth *Podargus strigoides*, Masked Lapwing *Vanellus miles*, Osprey *Pandion haliaetus*, White-bellied Sea-Eagle *Haliaeetus leucogaster*, Whistling Kite *Haliastur sphenurus*, Dollarbird *Eurystomus orientalis*, Laughing Kookaburra *Dacelo novaeguineae*, Eastern Rosella *Platycercus eximius*, Rainbow Lorikeet *Trichoglossus*

*moluccanus*, Blue-faced Honeyeater *Entomyzon cyanotis*, Noisy Miner *Manorina melanocephala*, Spotted Pardalote *Pardalotus punctatus*, Varied Sittella *Daphoenositta chrysoptera*, Australian Magpie *Gymnorhina tibicen*, Pied Butcherbird *Cracticus nigrogularis*, White-breasted Woodswallow *Artamus leucorhynchus*, Eastern Yellow Robin *Eopsaltria australis* and Welcome Swallow *Hirundo neoxena*.

**Table 2.** Species most often recorded at Tahlee and their overall Reporting Rates (RR)

Species	RR (%)
Noisy Miner <i>Manorina melanocephala</i>	92.4
Australian Magpie <i>Gymnorhina tibicen</i>	89.7
Laughing Kookaburra <i>Dacelo novaeguineae</i>	85.6
Australian Wood Duck <i>Chenonetta jubata</i>	84.0
Welcome Swallow <i>Hirundo neoxena</i>	82.5
Crested Pigeon <i>Ocyphaps lophotes</i>	78.7
Chestnut Teal <i>Anas castanea</i>	72.2
Rainbow Lorikeet <i>Trichoglossus moluccanus</i>	70.5
Whistling Kite <i>Haliastur sphenurus</i>	70.7
Magpie-lark <i>Grallina cyanoleuca</i>	70.7
Blue-faced Honeyeater <i>Entomyzon cyanotis</i>	70.7
Masked Lapwing <i>Vanellus miles</i>	70.1
Pied Butcherbird <i>Cracticus nigrogularis</i>	66.2
Lewin's Honeyeater <i>Meliphaga lewinii</i>	65.0
Yellow-faced Honeyeater <i>Caligavis chrysops</i>	64.3
Osprey <i>Pandion haliaetus</i>	62.7
Grey Fantail <i>Rhipidura fuliginosa</i>	62.0
Silver Gull <i>Chroicocephalus novaehollandiae</i>	62.4
Eastern Rosella <i>Platycercus eximius</i>	60.5
Grey Butcherbird <i>Cracticus torquatus</i>	58.6
Eastern Spinebill <i>Acanthorhynchus tenuirostris</i>	57.8
Spotted Dove <i>Streptopelia chinensis</i>	54.4
Eastern Whipbird <i>Psophodes olivaceus</i>	54.4
Willie Wagtail <i>Rhipidura leucophrys</i>	54.0
Scaly-breasted Lorikeet <i>Trichoglossus chlorolepidotus</i>	53.2
Australian King-Parrot <i>Alisterus scapularis</i>	52.5
Little Pied Cormorant <i>Microcarbo melanoleucos</i>	52.1
Pied Currawong <i>Strepera graculina</i>	51.7
Pied Cormorant <i>Phalacrocorax varius</i>	51.0
Spotted Pardalote <i>Pardalotus punctatus</i>	50.6

**Table 3.** Threatened species recorded in the study area and their seasonal and overall Reporting Rates

Species	Reporting Rates (RR %)				
	Summer	Autumn	Winter	Spring	Overall
Bush Stone-curlew <i>Burhinus grallarius</i>	1.5	6.3	15.7	16.0	9.9
Beach Stone-curlew <i>Esacus magnirostris</i>	0	0	0	2.0	0.4
Australian Pied Oystercatcher <i>Haematopus longirostris</i>	43.9	54.7	59.0	62.0	54.8
Sooty Oystercatcher <i>Haematopus fuliginosus</i>	7.6	7.8	9.6	12.0	9.1
Eastern Curlew <i>Numenius madagascariensis</i>	31.8	3.1	9.6	16.0	14.8
Bar-tailed Godwit <i>Limosa lapponica</i>	22.7	17.2	0	22.0	14.1
Black-tailed Godwit <i>Limosa limosa</i>	0	0	0	2.0	0.4
Little Tern <i>Sternula albifrons</i>	0	0	1.2	0	0.4
Osprey <i>Pandion haliaetus</i>	34.8	56.3	81.9	76.0	62.7
White-bellied Sea-Eagle <i>Haliaeetus leucogaster</i>	33.3	40.6	47.0	38.0	40.3
Powerful Owl <i>Ninox strenua</i>	0	3.1	0	0	0.8
Glossy Black-Cockatoo <i>Calyptorhynchus lathami</i>	1.5	6.3	8.4	2.0	4.9
Little Lorikeet <i>Glossopsitta pusilla</i>	6.1	34.4	22.9	14.0	19.8
Varied Sittella <i>Daphoenositta chrysoptera</i>	13.6	20.3	10.8	20.0	15.6

**Table 4.** Migratory shorebird species recorded in the study area and their seasonal Reporting Rates

Species	Reporting Rates (RR %)				
	Summer	Autumn	Winter	Spring	Overall
Whimbrel <i>Numenius phaeopus</i>	4.5	9.4	1.2	12.0	6.1
Eastern Curlew <i>Numenius madagascariensis</i>	31.8	3.1	9.6	16.0	14.8
Bar-tailed Godwit <i>Limosa lapponica</i>	22.7	17.2	0	22.0	14.1
Black-tailed Godwit <i>Limosa limosa</i>	0	0	0	2.0	0.4
Latham's Snipe <i>Gallinago hardwickii</i>	0	0	0	2.0	0.4
Common Sandpiper <i>Actitis hypoleucos</i>	4.5	3.1	0	4.0	2.7
Grey-tailed Tattler <i>Tringa brevipes</i>	10.6	23.4	0	22.0	12.5
Common Greenshank <i>Tringa nebularia</i>	0	1.6	0	0	0.4

## Uncommon birds of the Hunter Region

Several of the species recorded are considered uncommon within the Hunter Region (Stuart 2018). Mostly these had only 1-2 records at Tahlee in the study period (see **Appendix** for details; available at [www.hboc.org.au/the-whistler-volume-13/](http://www.hboc.org.au/the-whistler-volume-13/)). They included nocturnal species and some threatened species and migratory shorebirds, as noted earlier. Noteworthy others were Painted Button-quail *Turnix varius*, Forest Kingfisher *Todiramphus macleayii*, Spiny-cheeked Honeyeater *Acanthagenys rufogularis*, Forest Raven *Corvus tasmanicus*, and Spectacled Monarch *Symposiarchus trivirgatus*. Both Forest Kingfisher and Spectacled Monarch were near the southern limit of their range (Stuart 2018).

## Other observations

The period of several months from late 2017 was very dry which had some impacts, particularly on wetland species. The only records of White-necked

Heron *Ardea pacifica* were from that period. Conversely fewer ducks were observed then, compared to previous years.

Several species had noticeably different RRs in different seasons (see **Appendix** for details). Those which I consider worth mentioning are listed below. Note that I did not test the seasonal RR differences to assess if they might be statistically significant.

The Australasian Figbird *Sphecotheres vieilloti* and Olive-backed Oriole *Oriolus sagittatus* had greater RRs in spring compared with other seasons: 76% v 12% (winter) for the Figbird and 53% v 22% (winter) for the Oriole. The Shining Bronzecuckoo *Chalcites lucidus* had RRs of 18-20% in winter and spring yet was scarcely recorded at all in autumn or summer. Winter was also the preferred time for the Rose Robin *Petroica rosea* and Pied Currawong *Strepera graculina* (with their respective winter v summer observations: 11% vs 0% and 73% vs 20%). Both are known to be

altitudinal migrants, descending from their highland breeding sites to lower altitude areas in winter (Stuart & Williams 2016, Stuart 2018).

## DISCUSSION

### Species diversity

167 species were recorded in the 100 ha Tahlee area during the four-year baseline study. This compares favourably with similar studies elsewhere – for example, 178 species recorded in the 450 ha Cattai Wetlands in a nine-year study (Carlson 2015), 126 species at the 2,640 ha Curracabundi National Park in a four-year study (Drake-Brockman 2015) and 144 species at the c. 100 ha Green Wattle Creek Reserve in a 13-year study (Newman 2009).

On several occasions, large numbers of birds were observed in the water near the main building of Tahlee. Many cormorants (all four local species), gulls, terns, pelicans and raptors were feeding on the schools of fish present in numbers in the channels in Port Stephens. These observations were made in the early to mid-morning and occurred mid-winter (twice in the same month) and spring.

Reviewing the data of the **Appendix**, it is apparent that Tahlee was a place of passage for many species during the study period. There were seasonal fluctuations in the RR of species, indicating that birds were briefly passing through Tahlee or only staying for all or part of one season. Stuart (2018) defines Bird of Passage as ‘Species present in a suitable area for a relatively short period and equally likely to be observed in any month of the year.’

### Threatened species

Although the Bush Stone-curlew is an uncommon resident in the Hunter Region, Port Stephens is considered its stronghold, with an estimated six pairs present (Roderick & Stuart 2016). In that regional context, Tahlee is an important site for them. One of the Tahlee pair fledged at Bobs Farm in 2009 (A. Morris pers. comm.), which is ~12 km distant. Port Stephens is also a stronghold for Australian Pied Oystercatcher and some pairs now breed there (Roderick & Stuart 2016, Fraser & Stuart 2018). The clean waters of the Karuah estuary and abundant supply of its main food sources, worms, crabs and oysters, presumably

were the main reason that it was a regular visitor, especially at low tide.

The differences in RR for the Osprey appear to be associated with their breeding patterns. They begin building their nest in May, chicks are seen/heard from early spring and the birds have left the nest (or it is abandoned) by late spring/summer.

*Allocasuarina* spp, the main food source for Glossy Black-Cockatoo *Calyptorhynchus lathami* are abundant on the Tahlee property. Possibly this species was under-recorded in the surveys, due to its general shyness. An example occurred when I was leading visitors on a tour of the property. Just as I commented that Glossy Black-Cockatoo feed in the *Allocasuarinas*, and that they can be around without hearing them, several birds were observed eating quietly at the top of one tree. They continued to do so while the tour group moved on. The under-recording is further evidenced by observations of seed pods that had been broken up and left on the ground, indicating birds had recently been there though not seen on surveys.

The RRs for Little Lorikeet *Glossopsitta pusilla* and Varied Sittella *Daphoenositta chrysoptera* were around 15-20% (**Table 3**). Those RRs are considerably higher than for these woodland species across the overall Hunter Region (RRs 4-6%). Although the regional RRs include many areas of unsuitable habitat, the high RRs in Tahlee study area are an indication of the quality of these woodlands. The RR for another woodland species, the White-bellied Cuckoo-shrike, was similarly elevated (21.7% at Tahlee compared with 1.7% for the Hunter Region).

The Little Tern *Sternula albifrons* was recorded once, on 9 August 2017, when two birds were feeding with other terns on an incoming tide. Possibly these were birds on migration passage (A. Stuart pers. comm.).

### Migratory shorebirds

Tahlee and the wider Port Stephens region is a key area for migratory shorebirds (Stuart 2004 & 2011). The extensive tidal mudflats between Tahlee and Carrington (**Figure 1**) provide excellent year-round foraging grounds. Species such as Eastern Curlew, Whimbrel *Numenius phaeopus* and Bar-tailed Godwit were commonly seen in the migration season, reflected in the RRs presented in **Table 4**. Eastern Curlew and Whimbrel were recorded all year including throughout winter, indicating that Tahlee provides



suitable habitat for immature (non-breeding) individuals of these species.

The migratory waders at Tahlee are also recorded roosting and foraging in the nearby Gir-um-bit National Park. The littoral habitat at Tahlee therefore might be considered a natural extension of the habitat available in the National Park.

## Citizen Science

Two opportunities were identified for engaging local community members and visitors in the study and improving their bird-watching skills. In the 2016 and 2018 breeding seasons for Osprey, Tahlee community members took part in a project to monitor the birds from nest-building through until the eventually successful fledging. The local community and visitors were also encouraged to join the surveys of the Tahlee grounds and adjacent shorelines, and to contribute to preparation of a weekly bird list for the site. Observations from these community projects quickly became part of the routine discussions in the various forums available.

## CONCLUSIONS

The Tahlee area is important for several reasons. It is in a largely uninhabited area and is surrounded by two habitats that are protected, ensuring species have a safe and unspoilt corridor in which to live or move through. Its rich diversity comprising woodland and estuarine habitats provides excellent opportunities for foraging species.

The surveys conducted during the four-year study period from 2014 to 2018 have revealed a rich diversity of species, with 167 species recorded in the c. 100 ha study area from 263 surveys. This study will serve as a baseline for identifying future changes now that the site is being actively managed for its conservation values by the Tahlee owners.

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## Appendix. List of species recorded at Tahlee including overall and seasonal reporting rates

This is available on-line at [www.hboc.org.au/the-whistler-volume-13/](http://www.hboc.org.au/the-whistler-volume-13/).