

THE PRE-DAWN CALL OF THE WHITE-PLUMED HONEYEATER *Lichenostomus penicillatus*

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ABSTRACT

White-plumed Honeyeaters *Lichenostomus penicillatus* made pre-dawn calls from spring to late summer. They began at approximately civil twilight (25-30 minutes before sunrise) and lasted for an average of 12 minutes, after which time the birds used different diurnal calls. At Belair the pre-dawn calls consisted of 'chew' calls—a descending whistle running from about 3 KHz to 2 KHz in about 0.2 seconds—repeated four times interposed with the 'zip' call. Pre-dawn calls with a somewhat similar structure were recorded in Alice Springs and Geraldton, but in other areas such as Bendigo the pre-dawn calls were quite different. Playback of a variety of pre-dawn calls from White-plumed Honeyeaters always induced a response from birds of this species. The repeated 'chew' call was given also at the apex of the song flight and, since these and the pre-dawn calls were made mainly during the breeding season, the pre-dawn call probably plays a role in mate selection and maintenance of pair bonds, and is associated with breeding.

INTRODUCTION

The dawn chorus of bird song is familiar to many people both in the northern and southern hemispheres, and many have speculated on its biological significance (e.g. Catchpole and Slater 1995). Australian birds begin to sing about half an hour before sunrise (Keast 1993).

However, in the course of forty years of recording the songs of birds I have become aware that a number of Australian birds commence singing whilst it is still dark, making visual identification by human observers difficult. The problem of identification is compounded in that the song at this time of morning can differ from the typical daytime song of the birds and so is not readily recognisable. The change to normal daytime calls is made only when it is light enough to see.

In this paper I describe the pre-dawn calls of White-plumed Honeyeaters *Lichenostomus penicillatus* recorded over three years at Belair, South Australia and compare them to their pre-dawn calls from other areas (also see Crouch 2001).

METHODS

Recording locations and times

Most of my recordings of White-plumed Honeyeaters were made from a suburban back-

yard at Belair, a foothills suburb 7 km SSE of Adelaide, South Australia. The yard is atop a gully and faces southwest towards the Adelaide plains and sea. Grey box *Eucalyptus microcarpa* and South Australian blue gum *E. leucoxylo*n are prominent at the top of the gully (Figure 1).

Recordings of White-plumed Honeyeater calls at Belair were made three times per week, where possible, from late-1996 through to early-1999. During this period six to eight White-plumed Honeyeaters were regularly seen in my backyard, often visiting the bird baths. Recordings covered the time from 65 minutes before sunrise until the pre-dawn calls stopped, usually about 20 minutes before sunrise. Calls were recorded using a 36 cm parabola, high gain Sennheiser K6\ME64 microphone and a professional Sony TCM 5000 EV cassette and Sony mini-disc recorder. Sonagrams of bird calls were made by Fourier analysis using dedicated software (Ultrasound, University of Queensland) on a personal computer. White-plumed Honeyeater calls were played-back using a cassette recorder. Playback was done infrequently in several locations at a sound level similar to normal song.

I also recorded during the day the calls made by two White-plumed Honeyeaters at the apex of their song flights before they plummeted to the shelter of the eucalypts from which the pre-dawn calls were made earlier in the day. These 'chew' calls did not resemble their normal diurnal calls. Note that I refer to 'flight song' as the vocal part of the behaviour and 'song flight' as the visual component.

Calls of the White-plumed Honeyeater also were recorded over a three-week period in July 1998 in the MacDonnell Ranges (Heavitree Gap, Jessie Gap, Emily Gap), within Alice Springs (Olive Pink Botanical Gardens, Undoolya Park Reserve) and at an artesian bore (Gem Tree) in the southern Northern Territory (see Figure 2). The times listed for Alice Springs calls were adjusted in accordance with the Nautical Almanac (1996). I also obtained pre-dawn calls taken by others at various locations in South Australia, Victoria, New South Wales and Queensland.

Definitions of dawn, nautical and civil twilight

These terms are defined because White-plumed Honeyeaters (and other birds and bats) seem to respond to particular light levels in determining the timing of singing and other activities. 'Dawn' is the term usually applied to first light, somewhere in the hour before sunrise. However this is ill-defined and more precise terms are available. The Nautical Almanac (1996) divides the twilight before sunrise into nautical twilight and civil twilight. The commencement of 'nautical twilight' before sunrise corresponds to the sun being 12° below the horizon. The sky is very dark and many stars can be seen. 'Civil twilight' commences when the sun is 6° below the horizon, when the sky is light, few stars can be seen, a visual horizon is evident and colour vision is becoming effective. At Belair (latitude 35°S) this is 25–30 minutes before sunrise.

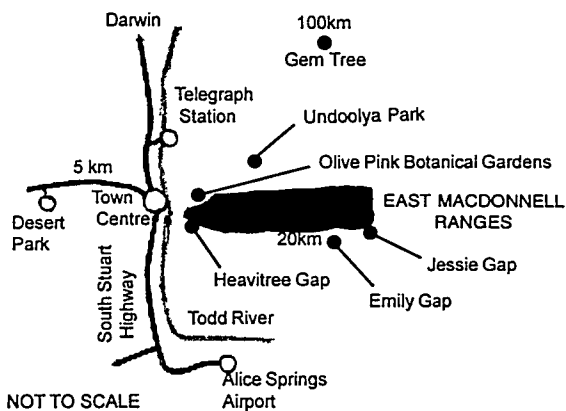


Figure 2. Approximate locations of and distances from Alice Springs of each recording site visited in the Alice Springs area.

RESULTS

Characteristics and structure of pre-dawn calls and diurnal songs

At Belair pre-dawn calls were made from song perches in a number of nearby eucalypts. Each of the eucalypts used had dense crowns. Not all song

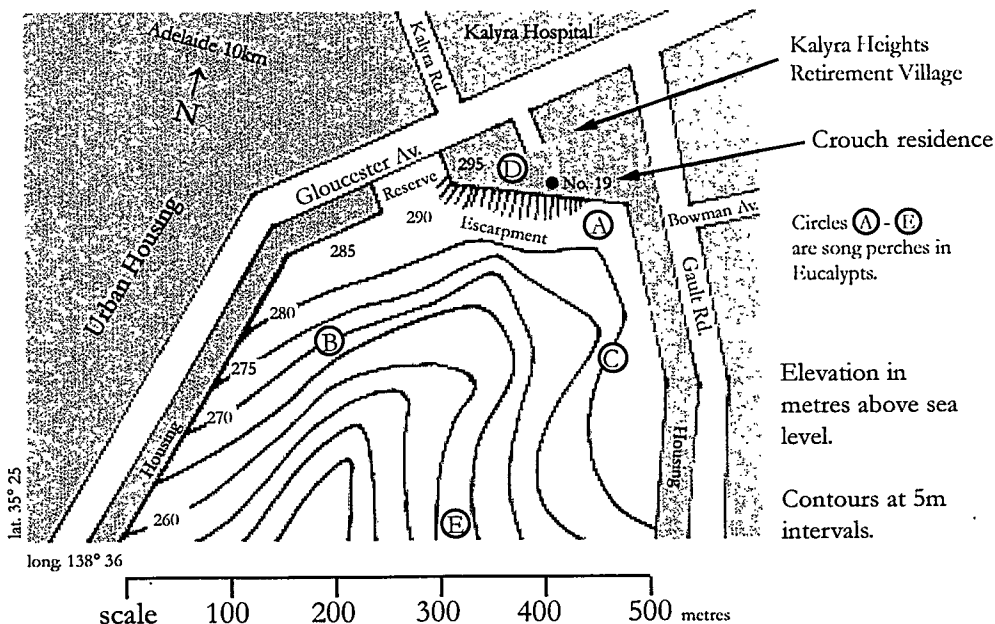


Figure 1. The study site at Belair. The unshaded section is the main study area, surrounded by a typical urban environment. Map based on Dept of Lands (SA) 1:10,000 map series sheet 6627-02.

perches were in use at any one time, but each seemed to remain in use for several weeks.

The sonographic structure of the pre-dawn call (Figure 3a) shows the 'chew' call which was the most common or basic pre-dawn call, recorded from a range of geographic locations in South Australia, Victoria, New South Wales, the Northern Territory and Western Australia. The 'chew' call consists of a series of descending whistles at regular intervals of 0.5–1.0 seconds, with sound frequency descending from about 3 KHz to 2 KHz (Figure 3a). The call is repeated regularly for 10 to 12 minutes, beginning close to the start of civil twilight, and is heard throughout the breeding season (spring to summer at Belair). This pre-dawn call is not mentioned in the popular field guides to Australian birds, but reports from colleagues suggest that experienced recorders are aware of

it (Bill Flentje, John Hutchinson, Andrew Skeoch and David Stewart pers. comm.).

As well as the basic 'chew' calls, White-plumed Honeyeaters in other areas may make other more complex pre-dawn calls. These occupy about the same frequency range as the simple calls (4 KHz to 2 KHz) and each note is down-slurred. The call is of a repetitive pattern, lasting about 12 minutes, and is given close to the start of civil twilight. These calls have also not been described in the popular field guides to birds. However the *Field Guide to Australian Bird Song* (Buckingham and Jackson 1983-1999) includes an example recorded by Bill Flentje in 1975 (see Table 1, track 32).

Other examples of 'early morning song' are included in Jurisevic and Sanderson (1994) and Crouch (1965 and 1978 pers. obs.). The complexity of many of these calls is such that, to the human ear, they could easily be mistaken for an unknown species.

Timing of pre-dawn calls

Figure 4 shows the timing of delivery of the pre-dawn calls from recordings made about three times a week in 1997 and 1998. Pre-dawn calls occurred in late summer (February–March) in 1997, then from winter 1997 (July onwards) to summer 1998 (February) and again from spring 1998 (August) to early summer 1998 (December). Pre-dawn calls were absent from April to July in 1997 and from March to August 1998. However, during daylight hours, the familiar 'chic-o-wee' call (see Figure 3b) occasionally was heard.

On a daily basis the onset of pre-dawn calls was close to the commencement of civil twilight and the calls lasted usually 10–12 minutes (Fig. 4). The time of start and finish of pre-dawn calls appeared to be influenced strongly by the light levels at civil twilight, e.g. later on cloudy days.

Responses of White-plumed Honeyeaters to playback of pre-dawn calls

An edited 'chew' note was replayed once at the study site at Belair around midday in April 1998 in the non-breeding season. A group of White-

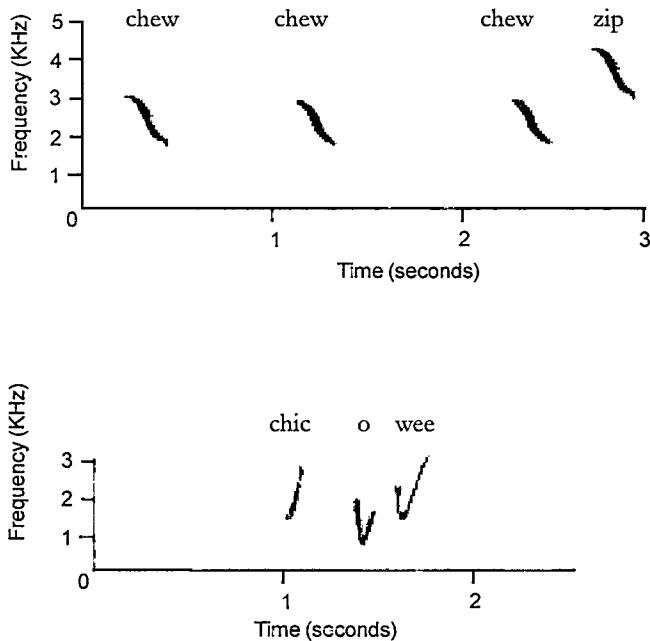


Figure 3. Sonagrams of two typical calls made by the White-plumed Honeyeater during the breeding season at the Belair study site.

3a (top). Pre-dawn call at Belair. A phrase of three or four 'chew' notes which are repeated at about 10 second intervals for periods of up to 12 minutes. This mellow song is taken up by other members of the group at about civil twilight. The 'zip' component never overlaps the 'chew' note and is heard at varying intervals during the pre-dawn call.

3b (bottom). Typical diurnal call at Belair. This cheerful 'chic-o-wee' call is heard at intermittent times throughout the day, and probably serves as a contact call (Pizzey and Knight 1997).

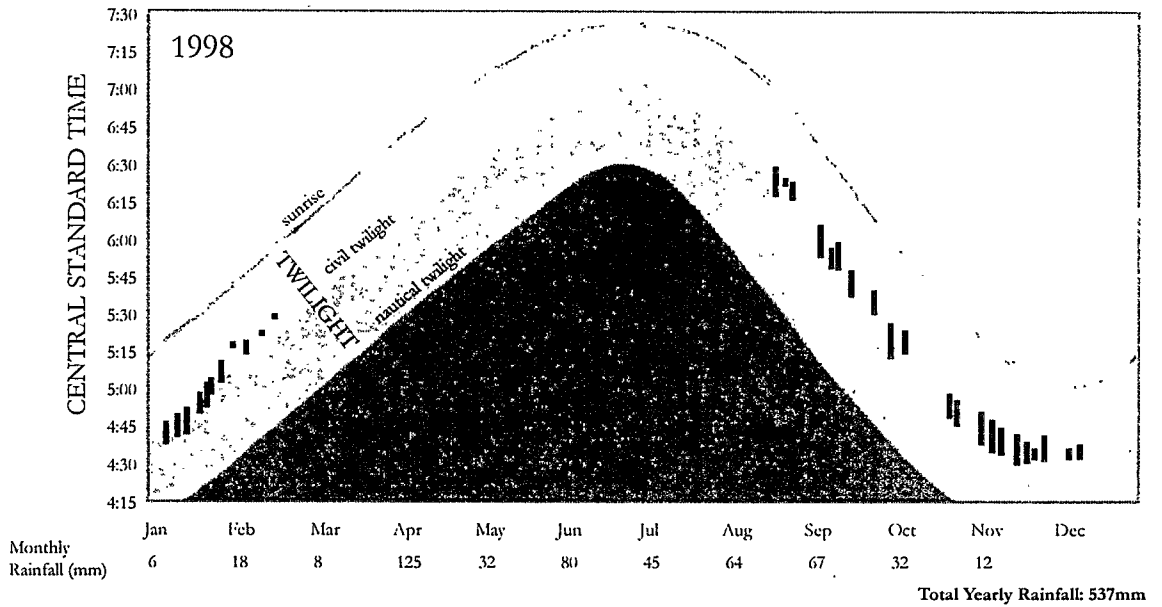
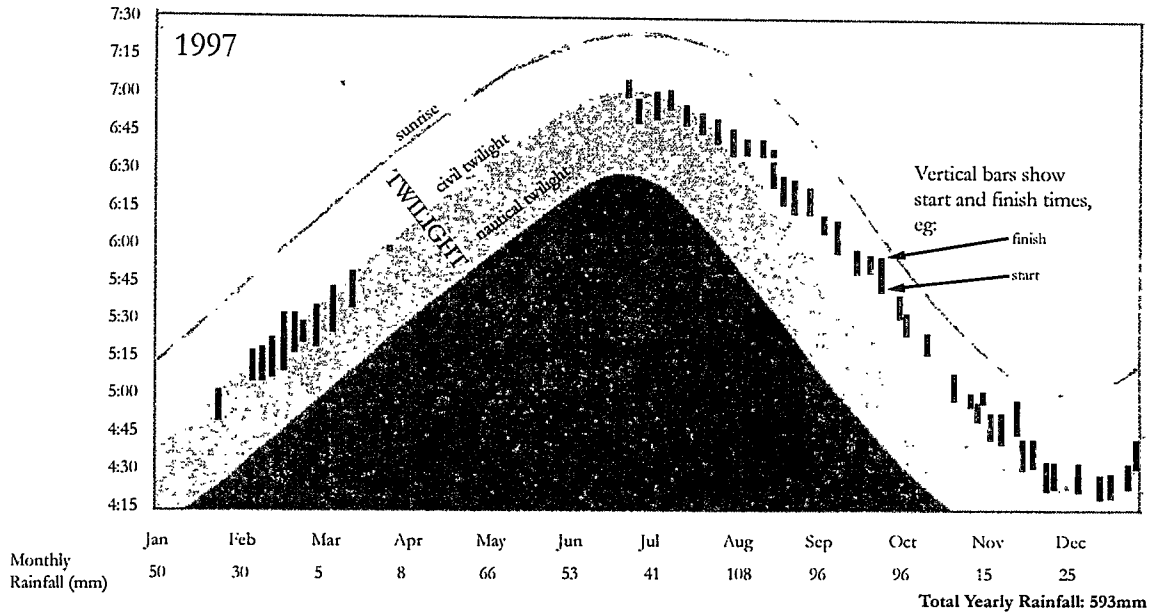


Figure 4. The starting and finishing times of the pre-dawn calls made by White-plumed Honeyeaters recorded at Belair over two successive breeding seasons. Monthly rainfall at the site is shown below the x-axes.

Table 1. Details of recordings associated with sonagrams illustrated in Figure 3.

| Track No. | Recording Date | Locality | Km from Study Site | Recorded by | Details |
|-----------|--|----------------------|--------------------|---------------|--------------------------------|
| 4 | 6/3/97 | Study Site | 0 km | H.Crouch (HC) | In eucalypt tree |
| 6 | 31/3/97 | Wirrabara, S.A. | 220 km N | HC | Behind grain silo |
| 8 | 9/10/97 | Bordertown, S.A. | 300 km SE | HC | In caravan park |
| 10 | 6/1/97 | Eden Hills, S.A. | 2 km SW | HC | Bushland Dve, Bellevue Heights |
| 12 | 19/5/63 | Carnarvon, W.A. | 2600 km W | J.Hutchinson | In vineyards |
| 14 | 0/2/65* | Belair, S.A. | 0.1 km | HC | Adjacent to study site |
| 16 | 13/9/97 | Gilberton, S.A. | 12 km N | HC | Creswell Park, Gilberton |
| 18 | 21/1/98 | Port Noarlunga, S.A. | 25 km SW | HC | Riverland Dve, Port Noarlunga |
| 20 | 23/12/97 | Malvern, S.A. | 5 km N | HC | Fisher St, Malvern |
| 22 | 23/12/97 | Malvern, S.A. | 5 km N | HC | Fisher St, Malvern |
| 24 | 18/1/97 | Malvern, S.A. | 5 km N | HC | Eton St, Malvern |
| 26 | 5/10/97 | Little Desert, Vic. | 500 km SE | HC | Little Desert Lodge |
| 28 | 28/8/93 | Mootwingee, N.S.W. | 450 km NE | A.Skeoch | National Park |
| 30 | 30/5/87 | Davenport Downs, Qld | 1350 km NNW | D.Stewart | Station property |
| 32 | 0/4/75* | Bendigo, Vic. | 500 km SE | W.Flentje | 50 km S of Little Desert |
| 34-45 | White-plumed Honeyeater calls recorded in the Alice Springs region (see Figure 4). | | | | |

* Precise date not known.

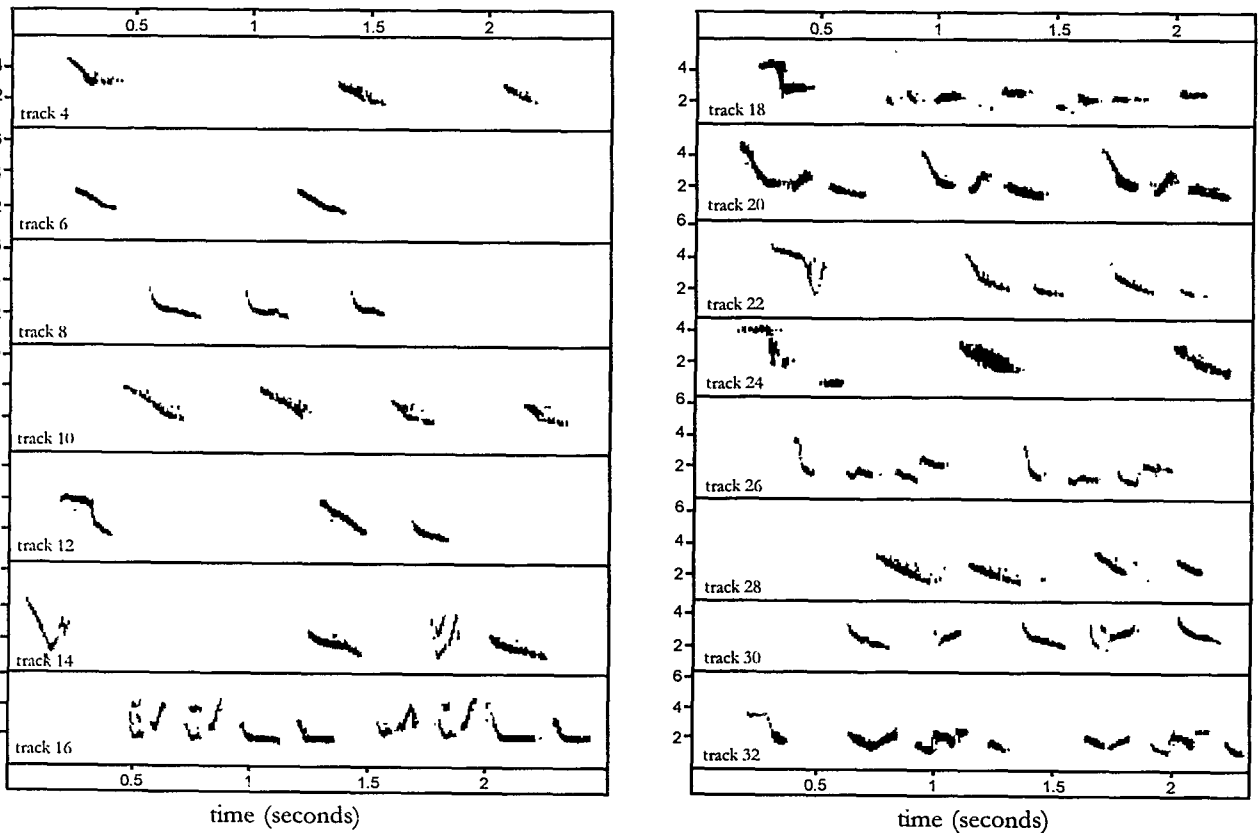


Figure 5. Sonagrams illustrating a selection of the pre-dawn calls of the White-plumed Honeyeater. The track number which appears at the bottom left-hand corner of each sonagram is the identification number for each call illustrated. Details of each track are given in Table 1 (intervening tracks are used to introduce the calls).

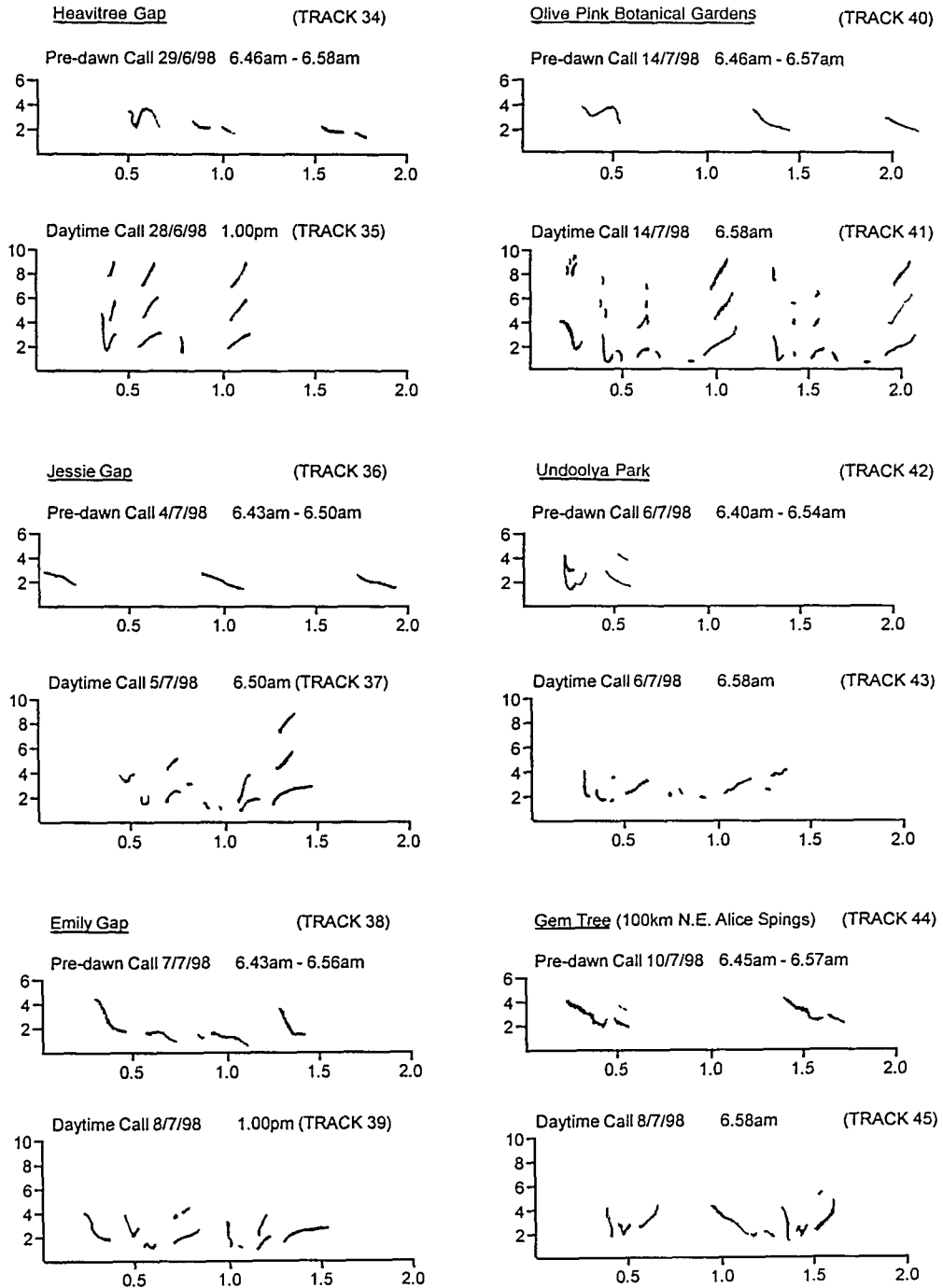


Figure 6. Sonograms showing the pre-dawn and diurnal calls of the White-plumed Honeyeater at six locations in the Alice Springs region. Each pair of calls was recorded at the same location within a period of 48 hours. X-axes = time in seconds, y-axes = frequency in KHz. Notice that all the pre-dawn songs illustrated ended in down-slurs and all the diurnal songs ended in up-slurs (Vicki Powys pers. comm. 2001). Further checks of the author's records have revealed that this feature may well prove to be definitive to the pre-dawn call of the White-plumed Honeyeater (and possibly extend to other species).

plumed Honeyeaters came to the playback site and fluttered round in a nearby eucalypt for about 30 seconds before flying off. About five minutes later a trial playback of a pre-dawn call which had been recorded previously at Gilberton in suburban Adelaide produced the same result.

A high-pitched 'zip' element is sometimes given at variable intervals between the 'chew' notes during the pre-dawn call at Belair (Figure 3a), but never overlaps them. Several 'zips' were replayed while the birds were nearby, but there was no obvious response.

Pre-dawn calls from the Little Desert in western Victoria (see Table 1, track 26) were also replayed at Little Desert at midday in the presence of a group of experienced ornithologists who were unable to identify the call. Within seconds a pair of White-plumed Honeyeaters appeared and copulated on an overhead branch.

Pre-dawn calls at other locations

Sonagrams of pre-dawn calls of White-plumed Honeyeaters from other locations around Australia illustrate the variation in these calls (Figure 5), but the calls remain distinct from the diurnal calls given by the birds. For example

Figure 6 shows sonagrams for the pre-dawn and daytime calls of White-plumed Honeyeaters for six locations in the Alice Springs region.

Flight songs of the White-plumed Honeyeater

Flight songs for White-plumed Honeyeaters differed from the daytime 'chic-o-wee' calls. The flight songs of White-plumed Honeyeaters at Belair consisted of a rapid six or seven 'chews', similar to the notes of the pre-dawn call or several 'der chews' (Figure 7). Flight songs at Belair coincided with the breeding season and were made at infrequent intervals throughout the hours of daylight.

DISCUSSION

The distinctive pre-dawn call of White-plumed Honeyeaters is made from song perches whilst it is still too dark to forage and at times in the year when White-plumed Honeyeaters are likely to be breeding. The distinctive 'chew' element of the pre-dawn call is not included in the typical daytime 'chic-o-wee' call, but appears as an element in the flight songs of White-plumed Honeyeaters. Given this, and the timing of the pre-dawn calls

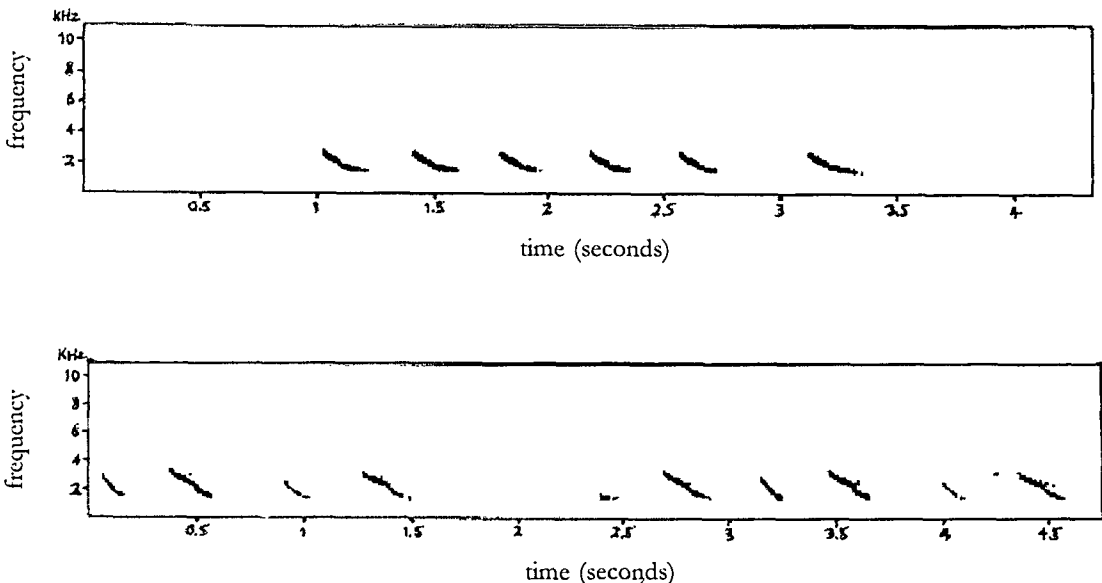


Figure 7. Sonagrams of the flight song of the White-plumed Honeyeater.

7a (top). I was only able to capture the second of two sequences of six 'chew' notes which comprised the flight song, before the bird swooped down to the eucalypt tree D at the study site (see Figure 1).

7b (bottom). Almost immediately another bird followed with a flight song in the vicinity of the eucalypt tree E at the study site (see Figure 1). This song consisted of 'der chew'—'der chew' notes.

to coincide with the breeding season, pre-dawn calls are probably related to breeding status, mate selection and the maintenance of pair bonds, and possibly only given by male birds, with a suitable territory to allow breeding.

Several other species of honeyeater also have unique pre-dawn calls, including the Singing Honeyeater *L. virescens*, Spiny-cheeked Honeyeater *Acanthagenys rufogularis* and Yellow-throated Miner *Manorina flavigula*, and these appear to be similar in structure and timing to those of the White-plumed Honeyeater. More careful study may reveal that most honeyeaters have pre-dawn calls that differ from their daytime calls. These patterns and the functions of pre-dawn calling warrant further study.

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