AUSTRALIAN BIRD WATCHER 1993, **15**, 108-115

Observations of Swallows and Martins Using a Flyway in Western Victoria

by A.K. SEMMENS, 49 Viewpoint Street, Ararat, Victoria 3377

Summary

Observations are presented on three species of swallow and martin (Hirundinidae) using a flyway in the Western District of Victoria, during their spring southward and post-breeding northward migrations. The flyway is a natural north-south corridor through a gap in the Great Dividing Range which runs east-west at that point. The birds' migratory and flocking behaviour, particularly in relation to adverse winds, is described.

Introduction

Three species of hirundines, the Welcome Swallow *Hirundo neoxena*, Tree Martin *Cecropis nigricans* and Fairy Martin *C. ariel*, are spring-summer breeding migrants to southern Victoria, with many birds absent or resident farther north in Victoria in autumn-winter (e.g. Blakers et al. 1984, Emison et al. 1987). The Welcome Swallow and Tree Martin behave similarly in Tasmania, with passage across Bass Strait and through southern Victoria (e.g. Newman & Patterson 1981, Blakers et al. 1984, Garnett et al. 1991).

Movements of birds over a varied land mass such as Australia are likely to be complex. Although intervening seas and oceans along migratory routes, such as those encountered in the Northern Hemisphere, do not pose a problem, the vast arid zone or the long dividing ranges of the eastern cordillera may be barriers. This suggests that migratory movements of hirundines require examination on a regional basis. Given the likelihood of passage through the region, and the local topography, the Ararat area of western Victoria suggested itself as a fruitful area for studying the north-south migratory movements of birds, and of hirundines in particular. This paper reports the results of observations made in such a regional study in the Western District of Victoria.

Topography

The Great Dividing Range extends southward almost unbroken from Cape York through Queensland and New South Wales until it reaches eastern Victoria, where it swings west to terminate in the Pyrenees Ranges. A corridor about 50 km wide extends west from the termination of the Pyrenees (Mt Buangor 968 m on the Mt Cole spur) to the Grampians (Mt William 1164 m), the latter broken by a system of ranges extending north and south for about 90 km. To the north, the corridor is open to the Wimmera-Mallee Plains, and to the south are the plains of the Western District. Except for the Ararat Corridor, and the Kilmore Geocol about 150 km east of Ararat (see Figure 1), there are only minor breaks in the Victorian range system to allow passage of large numbers of low-flying birds between inland eastern Australia and southern Victoria or perhaps Tasmania.

Observations, and a detailed examination of the features of the district, suggest that the corridor is divided into three separate flyways, each occupying a wide valley running between the northern and southern plains, and each with an altitude along the undulating valley bottom of about 300 m a.s.l. (see Figure 2, Plate 16):

(a) Flyway 1 extending from the foot of the Grampians eastward across to a network of minor hills running south from the Black Range west of Stawell, down through the Chalambar Range (One Tree Hill 579 m) and Kangaroo Range, west and south-west of Ararat respectively;
(b) Flyway 2 extending from Black Range and Chalambar Range eastward to a further network of hills of which Mt Langi Ghiran (922 m) is the highest; included along this undulating valley bottom is the Dunneworthy State Forest of almost 3000 ha of mature eucalypts;
(c) Flyway 3 encompassing the wide valley of the Wimmera River, but narrowing as it follows up Mt Cole Creek, and passing between Mt Langi Ghiran and the Mt Cole spur of the Pyrenees; it then passes down into the southern plains.

Figure 1. Map of Australia, showing location of Ararat Corridor and Kilmore Geocol.

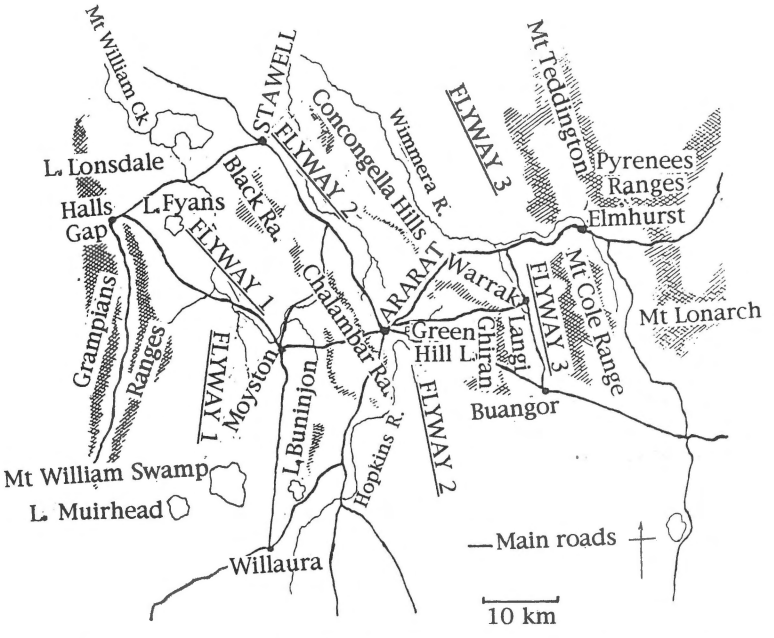


Figure 2. Map of study area, showing location of the three flyways in relation to Ararat.

At a local scale in the study area, natural watersheds result in rain- and spring-fed creeks and streams flowing north or south.

Methods

Extensive surveys were carried out in the autumn and spring of 1988 through the Ararat area, which covers about 2500 km². Regular patrols were undertaken along most of the tree-lined roads and lanes, each planned to enable observation of sites recognised as hirundine habitats. Subsequent sightings were recorded and broadly analysed to detect variations in the hirundine population over time. Over 4000 such 'site' observations in almost four years 1988-91 enabled a reasonable picture of hirundine residence and migratory movement. Although the methodology is recognised as not statistically pure, it was not intended as a hirundine census.

Results

Large numbers of hirundine flocks utilised the Ararat Corridor in western Victoria as a route on their annual movements. There was a substantial movement into and through the area, corresponding with a southward spring arrival and northward post-breeding departure. The birds' migratory routes were largely in harmony with the natural drainage lines of the Ararat area, which also run north and south. Because of their small size, wide wing-span and low mass, all three species of hirundines are sensitive to adverse winds. Their consequent need to perch in the lee of adverse winds allowed most of the observations on migratory movement and flocking.

The survey detected an apparently small, resident population of non-migratory hirundines in the Ararat area, during the non-breeding period broadly labelled as the 'winter' season. These were Welcome Swallows, with an occasional pair of Tree Martins. However, without banded birds it is not certain that they were permanent residents.

The surveys revealed habitat preferences of hirundines, both for routes of passage and for nesting sites. Open pasture along valley bottoms was favoured, particularly where tree-lined creeks and country lanes offer shelter for birds and the insects on which they depend. Elevated country such as ranges and hills was generally avoided, as also was dense forest, except that Tree Martins probably foraged around the lee side of forest edges (as in Tasmania: P. Park pers. comm.).

Chronology of movement

The usual migrations of hirundines through the Ararat Corridor took place within two time periods: a southward movement from mid August to mid November, and a northward movement from mid December to mid March. However, the drier than normal autumns of 1990 and 1991 suggested that the movements of hirundines in either direction may be influenced by seasonal conditions, as the movements varied from year to year by up to several months in their timing.

Of the three species, Welcome Swallows were the earliest in their arrival in the corridor, and their migratory movements persisted longer than those of the other two species, probably because of the Swallows' greater numbers. The Tree Martins were usually observed a week or two later than the Welcome Swallows, and appeared to complete their movement earlier than the latter, possibly in keeping with their smaller numbers. The Fairy Martins, although apparently common, were less obvious in the migratory movement possibly because of their tendency to mingle with Tree Martin flocks. They comprised the smallest proportion of the three hirundine species observed in the area.

Migratory and flocking behaviour

The hirundine flocks travelling under favourable conditions usually comprised 25-50 birds, sometimes up to 100. They moved along valleys, above tree-top height, favouring the general course of tree-lined creeks or lanes which run in the desired direction.

Ararat Corridor, from Mt. Cole. Flyway 3: from Mt Cole to Mt Langi Ghiran (left foreground); Flyway 2: from Mt Langi Ghiran to Chalambar Range (middle distance); Flyway 1: from Chalambar Range to the Grampians (far distance).

Plate 16 Photo: A.K. Semmens

These narrow belts of timber pass through open grassy paddocks over which the flocks came down low to hawk for insects, invariably on the lee side. At such times a feeding flock was difficult to recognise as migrant. The migrating flocks frequently stopped to feed, and appeared to spend a portion of each day hawking for insects during their migratory movement.

The actual passage of a flock was sometimes difficult to observe. A typical flock of Fairy Martins was recorded on 7 September 1989, moving along in a roughly spherical formation about 30 m in diameter, the individuals weaving within the group as it drifted along in a southerly direction. The lowest birds in the formation were probably about 20-30 m high; they were inconspicuous and would have gone unnoticed in the 10 km wide flyway, had they not been resting near an occupied Fairy Martin colony earlier that morning. Migrating Fairy Martin flocks were commonly seen apparently resting near occupied colonies. Whether they were attracted down temporarily by the sight of other birds is not known; in such cases the residual number of birds in the colony, after the flock had departed, did not appear to have changed.

A somewhat smaller flight of migrating Tree Martins was similarly observed as it left Green Hill Lake, and on another occasion, a larger one of Welcome Swallows. Both of these flocks were travelling at a lower height than the Fairy Martins, and in somewhat less compact formations. Among hundreds of migrating flocks observed these were among the few examples seen of the usual mode of travel. Most flocks were observed when they were sheltering from adverse weather.

In both Flyway 1 (east of the Grampians) and Flyway 3 (west of Mt Cole), the flight paths were more or less straightforward. If adverse winds were encountered, the flocks found shelter along the lee side of the trees, many perching among the upper foliage as well as on wire fences.

Large flocks were observed to the south of Flyway 1, on the open plains, hawking over shallow swamps which had been filled by unusually heavy local storms in the

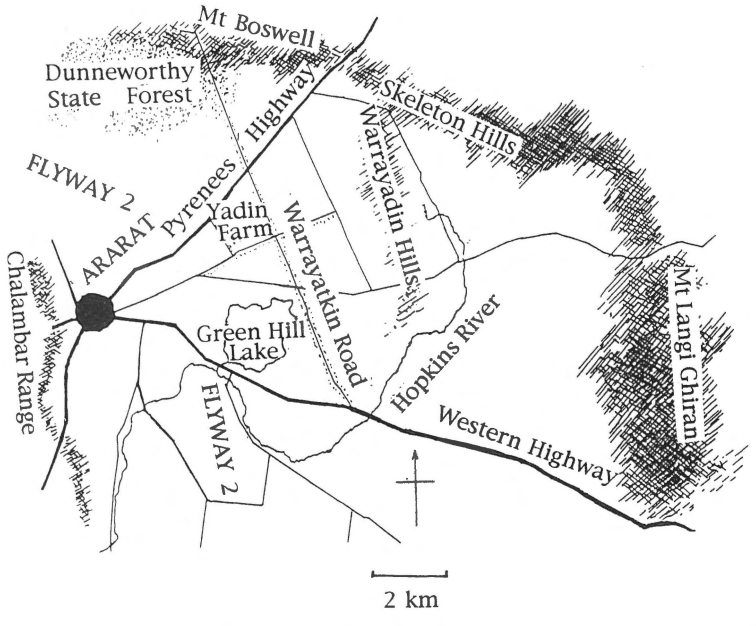


Figure 3. Map of Ararat district, showing detail of Flyway 2.

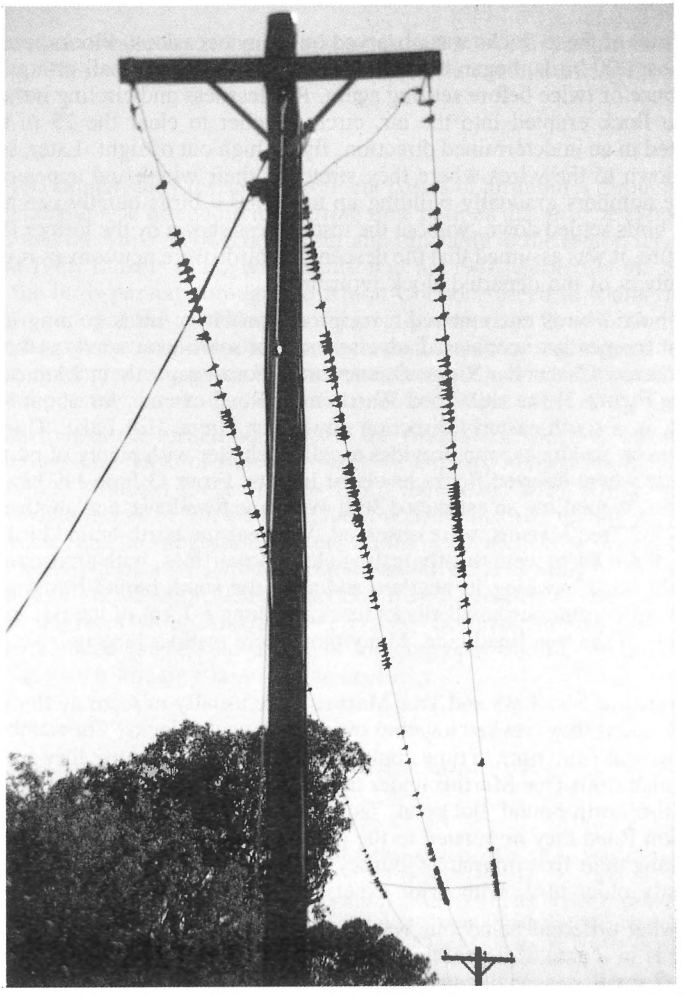
spring of 1988. On 27-28 August a mixed flock of Welcome Swallows and Tree Martins, over 100 of each species, was observed at Heard's Swamp, a shallow depression 200-300 m in diameter, 23 km south-west of Ararat. The flocks of the two species were seen to arrive separately, but had intermingled whilst hawking over the swamp. They had all moved on when the swamp was revisited on 29 August, but on 31 August 165+ Tree Martins were hawking and resting on fences; they had all gone by next day.

At Calvert's Swamp, a depression of similar size but divided by a gravel road, and 1.6 km to the east, 90+ Tree Martins were seen on 28 August; on 29 August 5+ Welcome Swallows and 75+ Tree Martins were there, but on 31 August only 30+ Tree Martins were seen. Only a few smaller gatherings of hirundines, presumably delayed by adverse winds, have been observed on this route, and only in spring and early summer of 1988; the swamps involved were dry by Christmas 1988, and did not fill again in the next three years.

Behaviour during adverse weather

Large numbers of north-bound birds from the southern plains were funnelled into Flyway 2 by the Kangaroo-Chalambar Ranges on the west, and Mt Langi Ghiran on the eastern flank (see Figure 3). Just to the north-east of Ararat, and to the north of Green Hill Lake, the Dunneworthy Forest intrudes across the flyway; flocks travelling over the undulating country turned north-west along the boundary of the forest.

Frequently in the summer north-bound flocks, on turning to the north-west in this section, apparently encountered adverse conditions and rested on a powerline at Yadin Farm (Plate 17). There are two intersecting country lanes at this point, both lined with mature red gums *Eucalyptus* sp. which provide a windbreak. Over a few hours,



Flock of 200+ Welcome Swallows at Yadin Farm (Flyway 2), sheltered by east-west windbreak of trees.

Plate 17 Photo: A.K. Semmens

incoming flocks built up to large numbers. Between 17 December 1989 and 29 March 1990 about 63 separate flocks, of an estimated 11 700 birds in total (mainly Welcome Swallows), had passed through. A flock was defined as >70 birds, in case a smaller flock was either a portion of the departing flock returning, or the beginning of the build-up of the next.

At Yadin Farm the largest flock recorded resting along the wires, or on nearby farm buildings, was an estimated 550+ birds on 23 February 1990. A larger flock, estimated at 688+ birds, was observed during the following season on 27 February 1991 and, on 25 January 1992, there were an estimated 863+ hirundines. These were only those birds which had been held up by adverse conditions, and the total numbers involved in movement were probably much higher.

Departure of these flocks was observed on many occasions. Flocks, ranging from 70 to almost 900 birds, began to show signs of restlessness, small groups taking off to circle once or twice before settling again. Restlessness and circling increased until the whole flock erupted into the air, circled higher to clear the 25 m trees, then disappeared in an undetermined direction, flying high out of sight. Later, birds began to filter down to the wires where they stretched their wings and appeared to settle down, the numbers gradually building up to 50-100+ birds quietly perching. If the incoming birds settled down, without the restlessness shown by the former flock before its departure, it was assumed that the descending birds were newcomers resting rather than members of the departed flock returning.

South-bound birds encountered a reciprocal problem: birds coming in from the north-west frequently encountered adverse south or south-west winds as they emerged from the narrow Chalambar Range-Dunneworthy Forest gap. About 1 km east of Yadin Farm (see Figure 3) the tree-lined Warrayatkin Road extends for about 9 km from the forest, in a south-easterly direction down past Green Hill Lake. This lane runs through grassy paddocks, and provides excellent shelter with plenty of pasture on the eastern side where delayed flocks hawk for insects. From 13 June 1990 to 24 August 1990, 27 flocks totalling an estimated 3681 Welcome Swallows, and another 26 flocks totalling 2167 Tree Martins, were observed. Whereas the north-bound birds observed at nearby Yadin Farm were mostly resting along powerlines, with an occasional flock of up to 40 birds hawking in nearby paddocks, the south-bound birds were spread out in almost continuous small flocks hawking along 6-7 km of the paddocks on the eastern side of the tree-lined lane. Many more were resting, largely obscured, in the foliage.

The Welcome Swallows and Tree Martins were usually in separate flocks initially, but on occasions they hawked together over the same paddocks. The number of Fairy Martins present from time to time could not be estimated, because they were difficult to distinguish from Tree Martins under those conditions. The difference in behaviour between the north-bound flocks at Yadin Farm and the south-bound birds along Warrayatkin Road may be related to the presence of many young and inexperienced birds making their first migratory journey northwards. The returning birds may have been mostly older birds with prior experience of the area.

Somewhat different behaviour was observed at Green Hill Lake in spring 1991. This lake is in a natural depression in Flyway 2, about 4 km east of Ararat (Figure 3). Several small, seasonal south-bound creeks flow into it. Several years ago it was dammed and now impounds about 270 surface hectares of water. The eastern and southern foreshores have been planted densely with trees and large native shrubs, which provide a windbreak against north and north-west or south and south-east winds.

Over a period of several hours on 15 September 1991 a mixed flock of hirundines built up on the eastern and southern foreshores, sheltering from a strong north-west wind. By 1540 h the flock comprised an estimated 30+ Welcome Swallows, 260+ Tree Martins and 50+ Fairy Martins. Many were resting on the gravel roadway; when they moved, they flew only a few metres, or shuffled or half-flapped for a few centimetres. They may have been on the road for warmth, or perhaps because the warmth attracted insect prey. Other birds rested on wire fences or low in the foliage of shrubs or trees, while others circled low.

By 1430 h on 16 September there were only 4+ Welcome Swallows in evidence, but by 1620 h on 17 September incoming birds had built up to 6+ Welcome Swallows, 98+ Tree Martins and 10+ Fairy Martins, which had all gone by 1400 h on 18 September. However, at 0950 h on 21 September incoming birds had reached a total

of 40+ Welcome Swallows, 200+ Tree Martins and 50+ Fairy Martins, which left later that day. This was the last flock of >10 birds seen at the lake during the remainder of spring 1991.

Discussion

This observational study revealed movement pulses of hirundines through a natural north-south corridor, in directions and during time periods that may be expected from the locality and the birds' known behaviour and timetable in the region (cf. Newman & Patterson 1981, Blakers et al. 1984, Emison et al. 1987, Garnett et al. 1991). It is likely that the birds passing through the Ararat Corridor breed in southern Victoria or Tasmania, and that this corridor is a regionally important flyway. The hirundine movements through the corridor, and their flight-path requirements, suggest that similar large-scale migratory movements may take place through the Kilmore Geocol in central Victoria, and possibly along the valley of the Glenelg River west of the Grampians.

The behaviour of the hirundine flocks in the Ararat Corridor was similar to that reported for migrating flocks of Welcome Swallows and Tree Martins leaving or arriving in Tasmania (cf. Mollison 1960, Thomas 1966, Templeton 1976). These similarities relate to seasonal trends in flock size; autumn-winter flocking, resting on wires and feeding en route; and pre-migration concentrations in open country. Perhaps the most significant behaviour observed around Ararat was the birds' feeding on the move, and then flying high out of sight. This behaviour may be related to the lack of ocean crossings for migrants within Australia: there is no need to accumulate pre-migratory fat, because the birds can take advantage of foraging opportunities en route; without body reserves, such foraging is a regular necessity.

Acknowledgements

The author is deeply indebted to the editor and three anonymous referees for their assistance in the preparation and presentation of this report.

References

Blakers, M., Davies, S.J.J.F. & Reilly, P.N. (1984), *The Atlas of Australian Birds*, Melbourne University Press, Melbourne.

Emison, W.B., Beardsell, C.M., Norman, F.I., Loyn, R.H. & Bennett, S.C. (1987), *Atlas of Victorian Birds*, Dept Conservation, Forests & Lands and Royal Australasian Ornithologists Union, Melbourne.

Garnett, S.T., Sutton, P., Lowe, K. & Gray, S. (1991), 'Land bird movements across north-east Bass Strait, autumn 1988', *Corella* **15**, 1-7.

Mollison, B.C. (1960), 'Notes on Tasmanian birds. I. Migration of the Tree Martin', *Emu* **60**, 55-56.

Newman, M. & Patterson, B. (1981), 'Welcome Swallow and Tree Martin migration from Tasmania', *RAOU Newsl.* **50**, 11-12.

Templeton, M.T. (1976), 'Movement of Welcome Swallows through Loorana, King Island, Tasmania', *Emu* **76**, 86-88.

Thomas, D.G. (1966), 'Observations on the arrival of the Welcome Swallow and Tree Martins in the Hobart area, spring 1964-65', *Emu* **66**, 33-38.

Received 10 January 1992